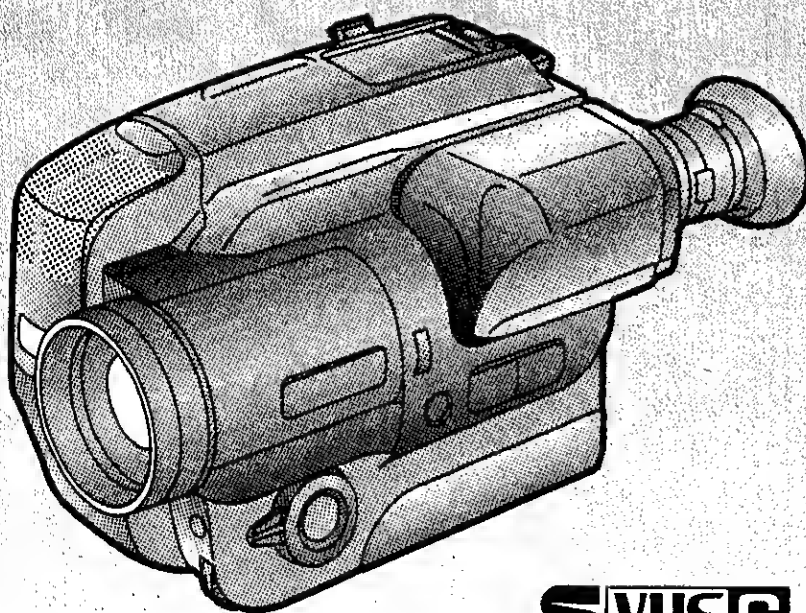


Panasonic

S-VHS-C Movie Camera

NV-S90A

Operating Instructions



S VHS C
625

VHS
PAL

NV-S90A

Hi-Fi
STEREO

Before attempting to connect, operate or adjust this product, please read these instructions completely.

VQT5743

Basic
Operations

3~

Advanced
Operations

24~

Options/
Editing

46~

Miscellaneous/
Care of Unit

52~

Index

62~

Dear Customer, We would like to take this opportunity to thank you for purchasing this Panasonic Movie Camera.
Please read these Operating Instructions carefully and keep them handy for future reference.
Please keep your receipt as proof of purchase for all warranty repairs.

Information for Your Safety

IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

S-VHS-C Movie

- The rating plate is on the bottom side of the Movie Camera.

AC Adaptor

- The rating plate is on the bottom side of the AC Adaptor.

FOR YOUR SAFETY

■ DO NOT REMOVE THE OUTER COVER.

To prevent electric shock, do not remove the cover. There are no user serviceable parts inside. Refer servicing to qualified service personnel.

IF THE SUPPLY CORD OF THIS EQUIPMENT IS DAMAGED, IT MUST BE REPLACED BY THE SPECIAL CORD.

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

Contents

Basic Operations

Check List for the Standard Accessories	3
Controls and Functions	4
Using the AC Adaptor as Power Supply Unit	6
Watching Picture on a TV Set	6
To Power Movie Camera ON/OFF	8
Inserting the Video Cassette	8
Adjusting the Viewfinder	8
Inserting the Button-Type Battery	10
Setting the Date and Time	10
Inserting and Deleting the Date and Time	12
Starting Filming (Recording)	12
Making the Subject Larger or Smaller During Filming	12
Using the Tape Counter Indication	14
Using the Memory Function	14
Confirming the Remaining Tape Time	14
Quick Reference Guide to the Indications in the Viewfinder	16
Playing Back on the Viewfinder or the TV	20
Rewinding or Fast-Forwarding the Tape	20
Using the Cue, Review and Still Playback Functions During Normal Playback	20
Playing Back on VTR, use the Supplied Cassette Adaptor	22

Advanced Operations

Charging the Battery Pack	24
Attaching the Charged Battery Pack	24
Filming with the Auto Focus Mode	26
Filming with the Manual Focus Mode	26
Filming with Automatic White Balance Adjustment	28
Filming with Manual White Balance Adjustment	28
Colour Temperature and White Balance	30
Using the Menu Function	32
Filming a Still Picture for 5 Seconds (Snapshot)	32
Filming Fast-Moving Subjects	34

Making People Stand out Sharply from the Background	34
Filming Dark Scenes More Brightly	34
Fading In the Picture and Sound	36
Fading Out the Picture and Sound	36
Adjusting the Shutter Speed and Iris	36
Digital Gain-up Function	38
Digital Zoom Function	38
Digital Strobe Function	38
Digital Image Stabilizer Function	38
Fading Over from the Last Recorded Scene to the Next (Digital Wipe)	40
Fading Over from the Last Recorded Scene to the Next (Digital Mix)	40
Checking the End of the Recorded Scene	42
Locating a Point Where You Wish to Add a New Scene	42
Adjusting the Tracking	42
Using the Power Save Functions	44

Options/Editing

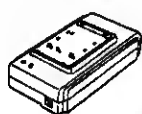
Using the Car Battery Cord (Optional)	46
Editing a Previously Recorded Tape	47
Using the VITC Function	49
Using the Audio Dubbing Function	50
Optional Accessories	51

Miscellaneous/Care of Unit

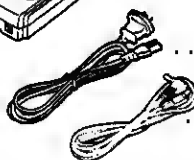
Adjusting the Length of the Grip Belt	52
Attaching the Shoulder Strap	52
Storage	52
Cleaning the Viewfinder	53
Preventing Accidental Erasure of Recordings	53
Before Requesting Service	54
Cautions	56
Condensation	56
Questions & Answers	57
Index	62
Specifications	Back Cover

Check List for the Standard Accessories

AC Adaptor Set



AC Adaptor



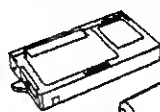
Mains Cable

DC Input Cable



Battery Pack

- When purchasing an additional AC Adaptor, order model number VW-AS4E.
- For Purchasing additional Battery Packs, see the list of optional accessories on p. 51.



Cassette Adaptor

Battery



Audio/Video Cable



S-Video Cable



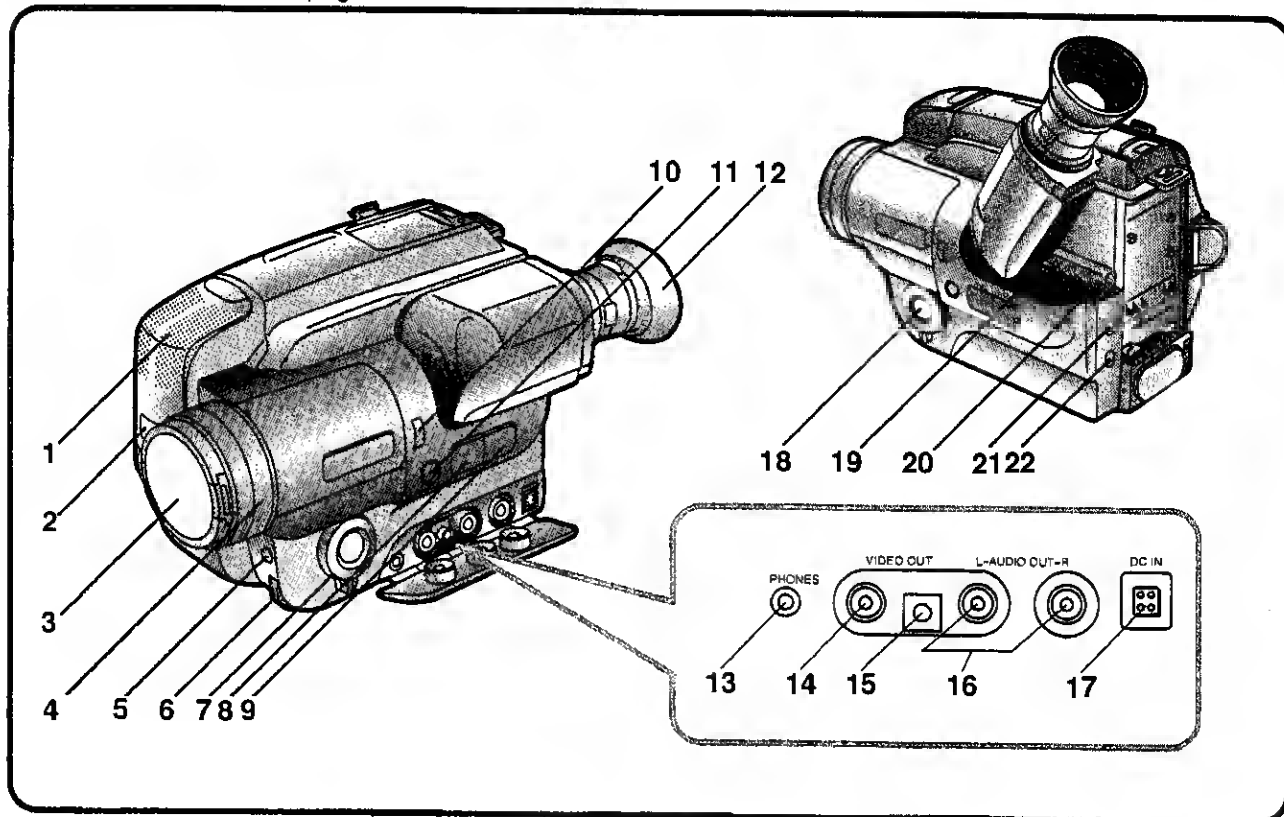
Button-Type Battery



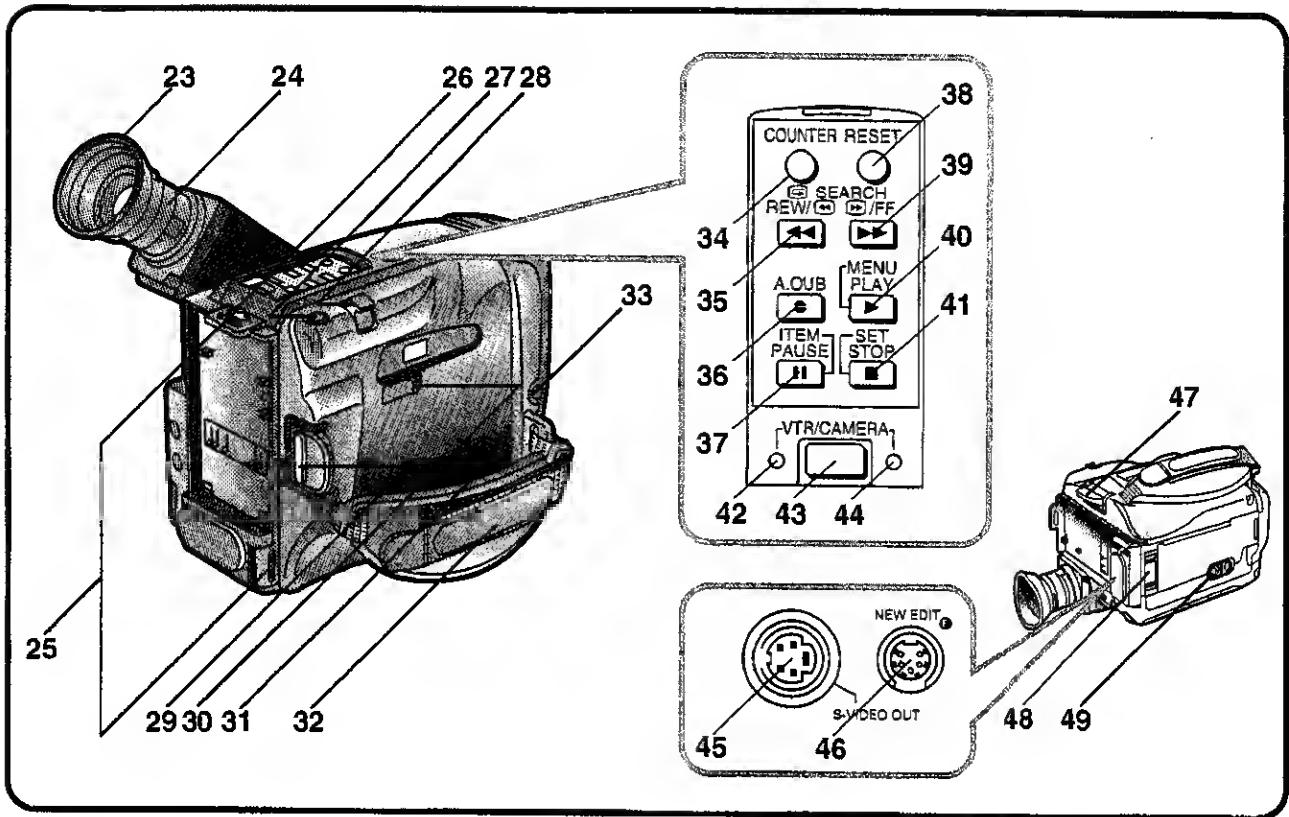
Shoulder Strap

Controls and Functions

For more details, see the pages indicated in brackets.



- | | |
|---|--|
| <p>1 Microphone</p> <p>2 Infra-Red Sensor (p. 28)</p> <p>3 Lens Cap (p. 8, 28)</p> <p>4 Focus Ring (p. 27)</p> <p>5 [FOCUS] Button (p. 26)</p> <p>6 [SHUTTER/IRIS] Control (p. 36)</p> <p>7 [AE] Dial (p. 13, 26, 28, 35, 36)
Use this dial to select the desired AE mode.</p> <p>8 [FADE] Button (p. 36)</p> <p>9 [DATE/TIME] Button (p. 10)</p> <p>10 Digital Dial (p. 38, 40)
Turn this dial to select the desired digital function.</p> <p>11 [W.B] Button (p. 29)
Manual White Balance Button</p> <p>12 Eyecup (p. 53)</p> <p>13 [PHONES] Socket (p. 20)</p> <p>14 [VIDEO OUT] Socket (p. 6)</p> <p>15 [RF DC OUT] Socket
To playback via a TV Set without AV Input Socket, connect this Socket to the RF IN Socket of the TV Set using an RF Adaptor (optional).</p> <p>16 [AUDIO OUT] Sockets (p. 6)</p> | <p>17 [DC IN] Socket (p. 6)</p> <p>18 [SHUTTER/IRIS] Button (p. 37)</p> <p>19 [DATE/TIME/SHIFT • ◀ TRACKING] Button (p. 10, 43)
Press this button to adjust the tracking, or to advance to the next item during the setting of the date and time.</p> <p>20 [DATE/TIME/SET • TRACKING ▶] Button (p. 10, 43)
Press this Button to adjust the tracking, or to set the correct date and time.</p> <p>21 [POWER SAVE] Switch (p. 44)
When this Switch is set to "ON", the Power Save Function will be activated.</p> <p>22 [AUDIO SELECT] Switch (p. 50)</p> |
|---|--|



23 Viewfinder (p. 16)

24 Eyeplece Corrector Ring (p. 9)

25 Shoulder Strap Holders (p. 52)

26 [BATTERY EJECT] Lever (p. 25)

27 [SNAPSHOT REC] Button (p. 33)

28 [W•T] Zoom Lever (p. 13)

29 Record Start/Stop Button (Red) (p. 13)

30 [EJECT] Lever (p. 8)

31 Cassette Compartment

32 Grip Belt (p. 52)

33 [MIC] Socket

To record sound with an external microphone (optional), connect it to the [MIC] Socket. (Connecting an external microphone automatically disconnects the built-in microphone.) Ensure that the microphone conforms with the following requirements:

- Connection Cable: M3-type plug
- Impedance: less than 4.7 kohm
- Type: Stereo-type
(If a mono-type microphone is connected, no sound will be recorded on the right channel).
- Sensitivity: Approx. -70 dB
- Power Source: Type that does not require a power source

34 [COUNTER] Button (p. 14)

35 [REW/FF] Button (p. 20, 42)

Use this Button:

- Recording Review
- Review
- REW (Rewind)
- Camera Search

36 [A.DUB] Button (p. 50)

37 [ITEM/PAUSE] Button (p. 21, 32)

38 [RESET] Button (p. 14)

39 [MENU/PLAY] Button (p. 20, 37)

Use this Button:

- Cue
- FF (Fast-Forwarding)
- Camera Search

40 [MENU/PLAY] Button (p. 21, 32)

41 [SET/STOP] Button (p. 21, 33)

42 "VTR" Indication Lamp (p. 20)

43 [VTR/CAMERA] Button (p. 20)

Press this Button to select the "VTR" Mode or the "CAMERA" Mode.

44 "CAMERA" Indication Lamp (p. 12)

45 [S-VIDEO OUT] Socket (p. 7)

46 [NEW EDIT E] Socket (p. 48)

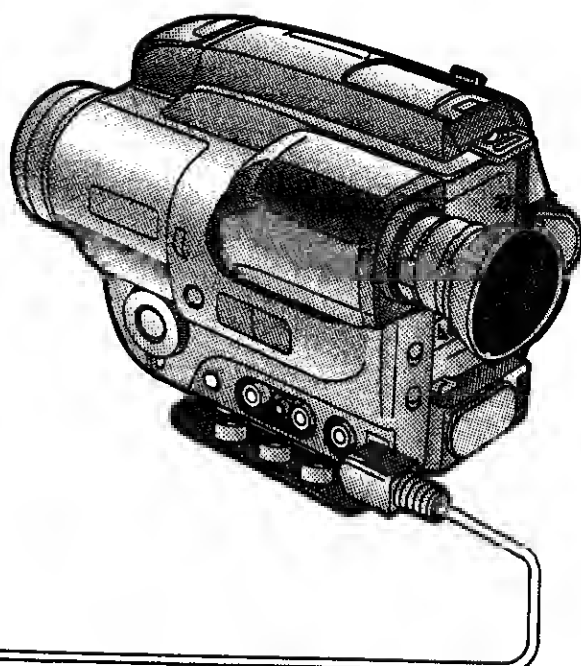
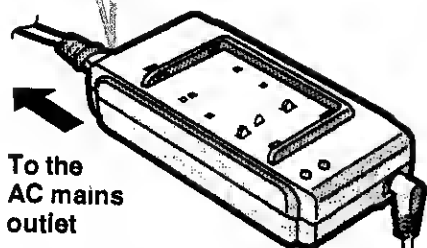
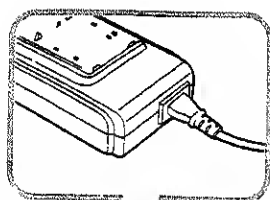
47 [POWER] ON/OFF Switch (p. 8)

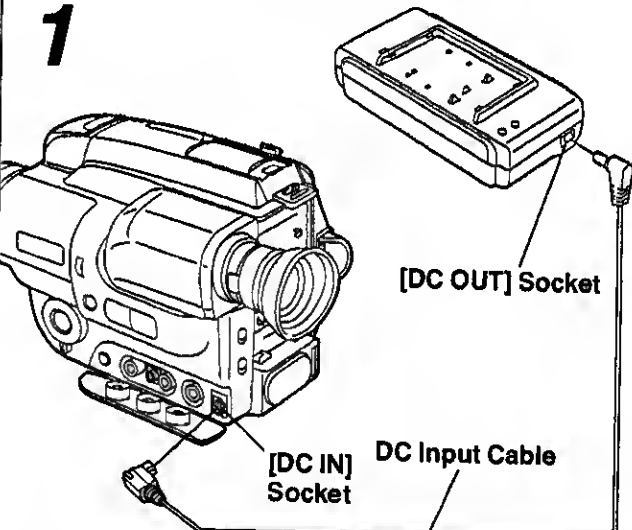
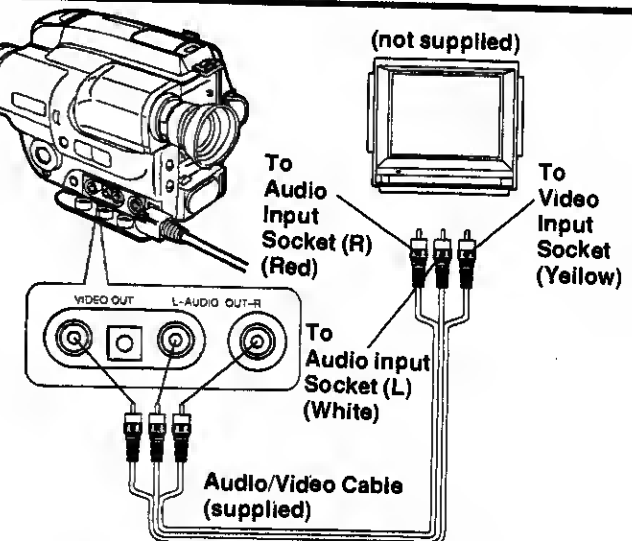
48 Button-Type Battery Compartment (p. 10)

This Compartment holds the supplied Button-Type Battery (CR 2032).

49 Tripod Receptacle

Attach a Tripod (optional) to this Receptacle.



Title	Procedure
<p>Using the AC Adaptor as Power Supply Unit</p> <p>To use the Movie Camera with the Battery Pack, it is necessary to charge the Battery Pack first. (p. 24)</p>	<p>1</p>  <p>[DC OUT] Socket</p> <p>[DC IN] Socket</p> <p>DC Input Cable</p>
<p>Watching Picture on a TV set (Using the Audio/Video Cable or S-Video Cable)</p> <p>Connect after turning off the Movie Camera and the TV Set.</p>	 <p>(not supplied)</p> <p>To Audio Input Socket (R) (Red)</p> <p>To Video Input Socket (Yellow)</p> <p>To Audio Input Socket (L) (White)</p> <p>Audio/Video Cable (supplied)</p> <p>VIDEO OUT L-AUDIO OUT-R</p> <p>Connect the Movie Camera to the TV set.</p>

Cautions for the AC Adaptor

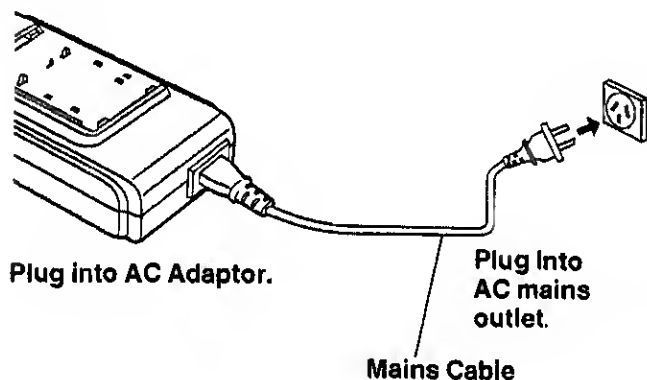
■ Cautions for Use

- Before connecting the AC Adaptor to an AC mains socket confirm that the voltage and frequency on the rating plate match the local AC mains voltage and frequency. (The AC Adaptor can be used within a voltage range of AC 100 V–240 V, and a frequency of 50 or 60 Hz.)
- Do not handle the AC Adaptor with wet hands.

■ Caution for Cleaning

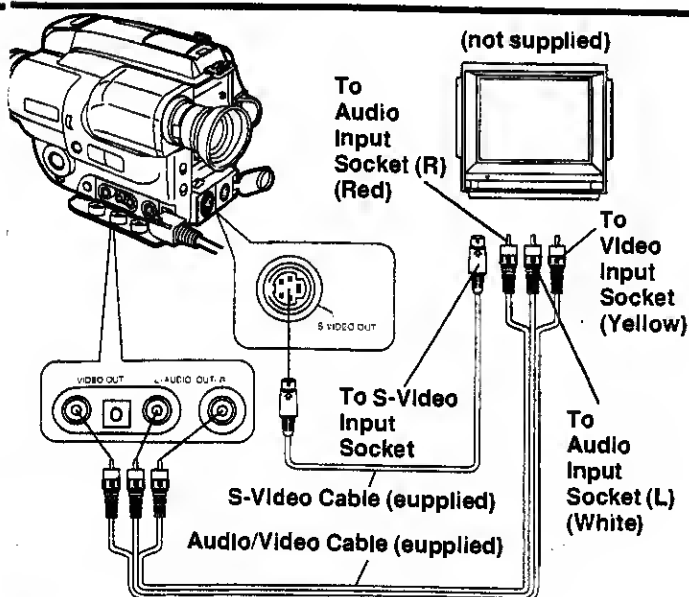
Before cleaning the AC Adaptor, make sure that it is disconnected from the AC mains socket.

2

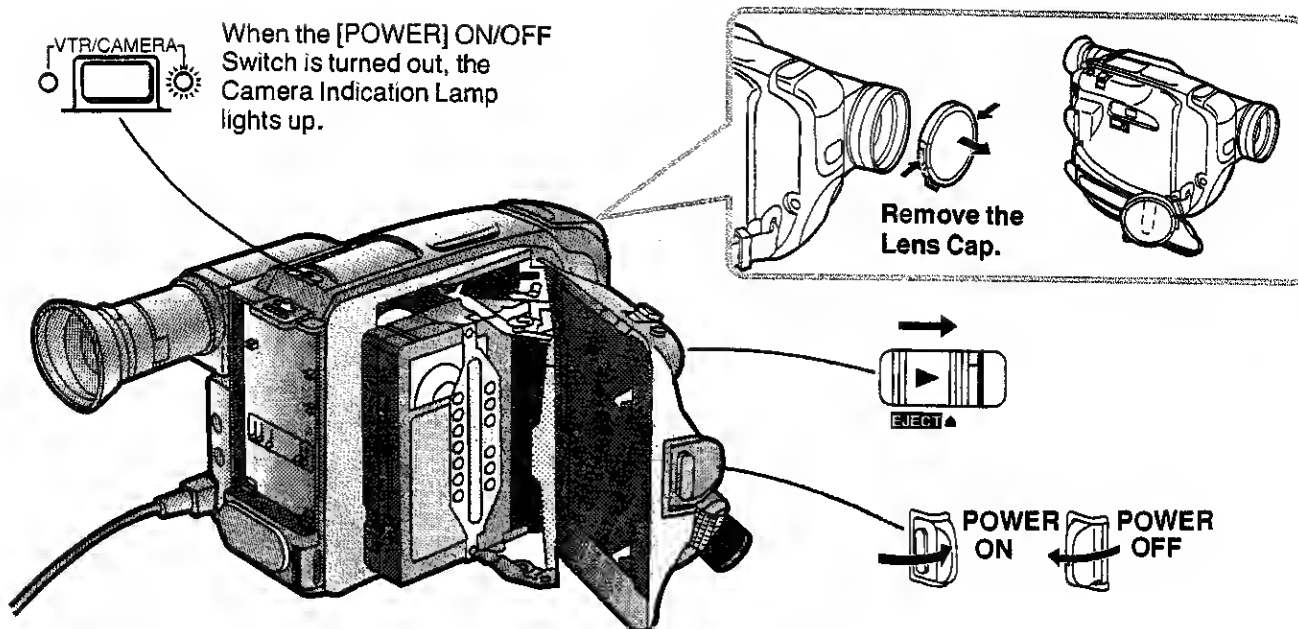


Remarks, etc.

- When the AC Adaptor is used to supply the Movie Camera with power, remove the Battery Pack from the AC Adaptor as it cannot charge the Battery Pack and provide power simultaneously.
- Do not use the AC Adaptor for any purposes other than supplying the unit with power or charging the Battery Pack.
- When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio farther away from the AC Adaptor.
- When not using the AC Adaptor, unplug its mains cable. When unplugging the mains cable, pull it by the plug, not by the cable.



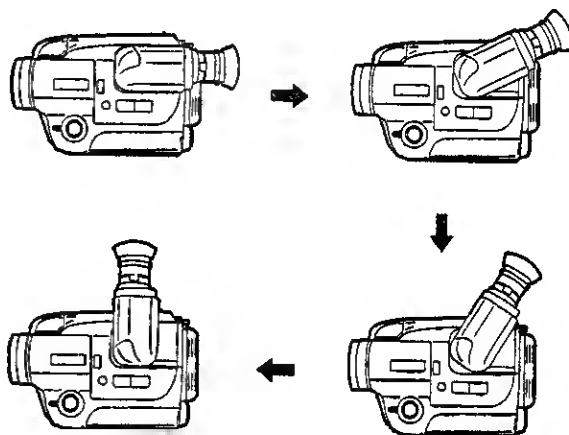
- If your TV set is not equipped with an AV Input Socket, the RF Adaptor (optional) is necessary. For its connection, read the operating instructions of the RF Adaptor (VW-RF7E).



Title	Procedure	
To Power Movie Camera ON/OFF	1 ON Turn [POWER] ON/OFF Switch out.	2 OFF Turn [POWER] ON/OFF Switch in.
Inserting the Video Cassette Before Inserting the video cassette, make sure that the tape is tight. If it is loose, turn the cog wheel in the direction of the arrow to tighten it. Cog Wheel	1 Slide the [EJECT] Lever.	2 insert the video cassette.
Adjusting the Viewfinder Grasp Projections on either side of the Viewfinder (see Fig. 1) and extend to fully locked position.	1 Projection Extend to fully locked position.	2 Turn [POWER] ON/OFF switch out.

Adjusting the Angle of the Viewfinder

The tilting range of the Viewfinder is 90° (4 positions are marked by click stops).



Remarks, etc.

- When turning on the Movie Camera while a video cassette is already inside, it will automatically be put in the Filming Pause Mode. (p. 13)

3



Close.

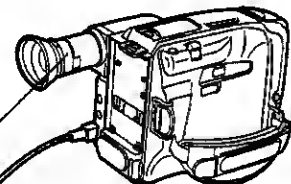
■ Ejecting the Video Cassette

Slide the [EJECT] Lever and pull out the Video Cassette. Close the Cassette Compartment Cover.

- It is not possible to take out the video cassette during filming.
- Do not repeatedly insert and take out the video cassette. This could cause the tape to become loose and damaged.

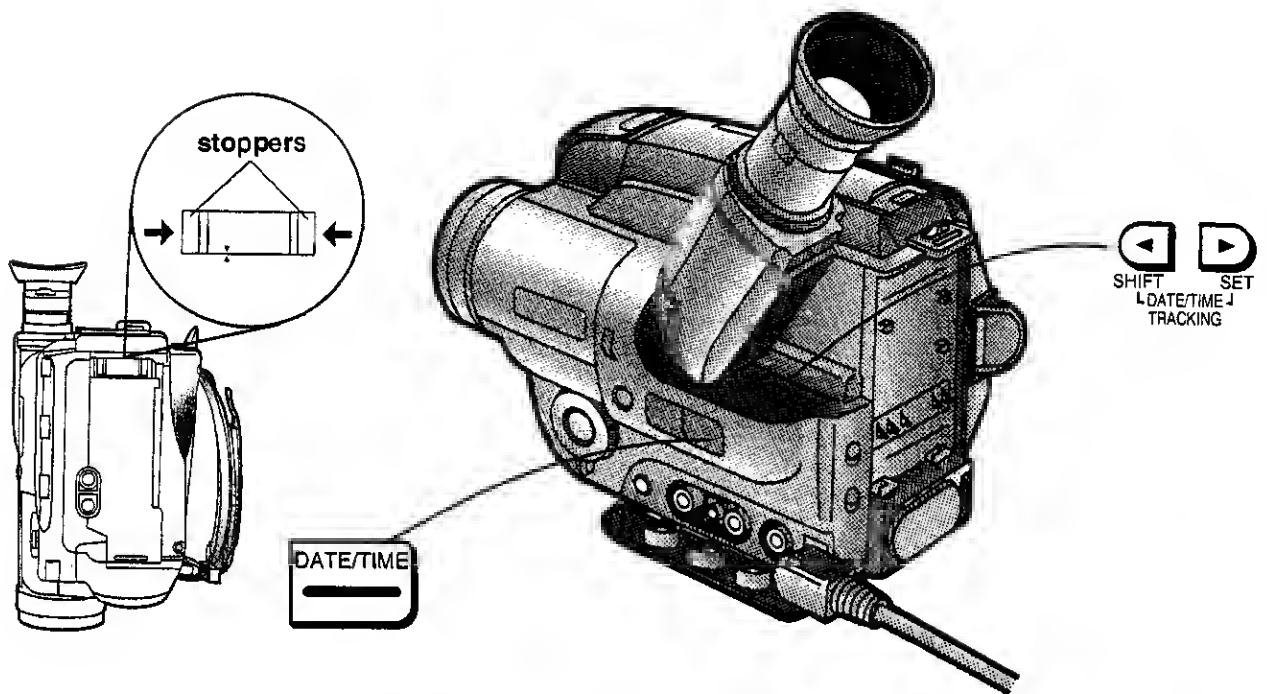
3

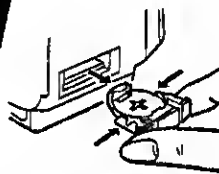
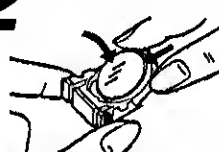





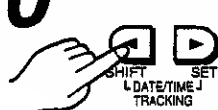
Eye-piece Corrector Ring



While looking into the Viewfinder, turn the Corrector Ring until the indications in the Viewfinder can be seen most clearly.

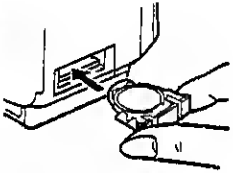
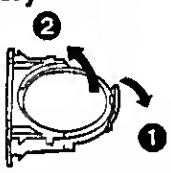


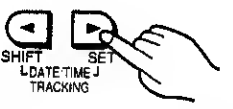

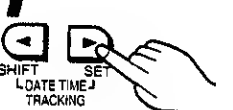

- When extending the Viewfinder, do not grasp it by the Eyecup, because the Eyecup could become detached from the Viewfinder.
- Do not apply any pressure on the Viewfinder except when extending or retracting it.
- Be sure to retract the Viewfinder after filming.

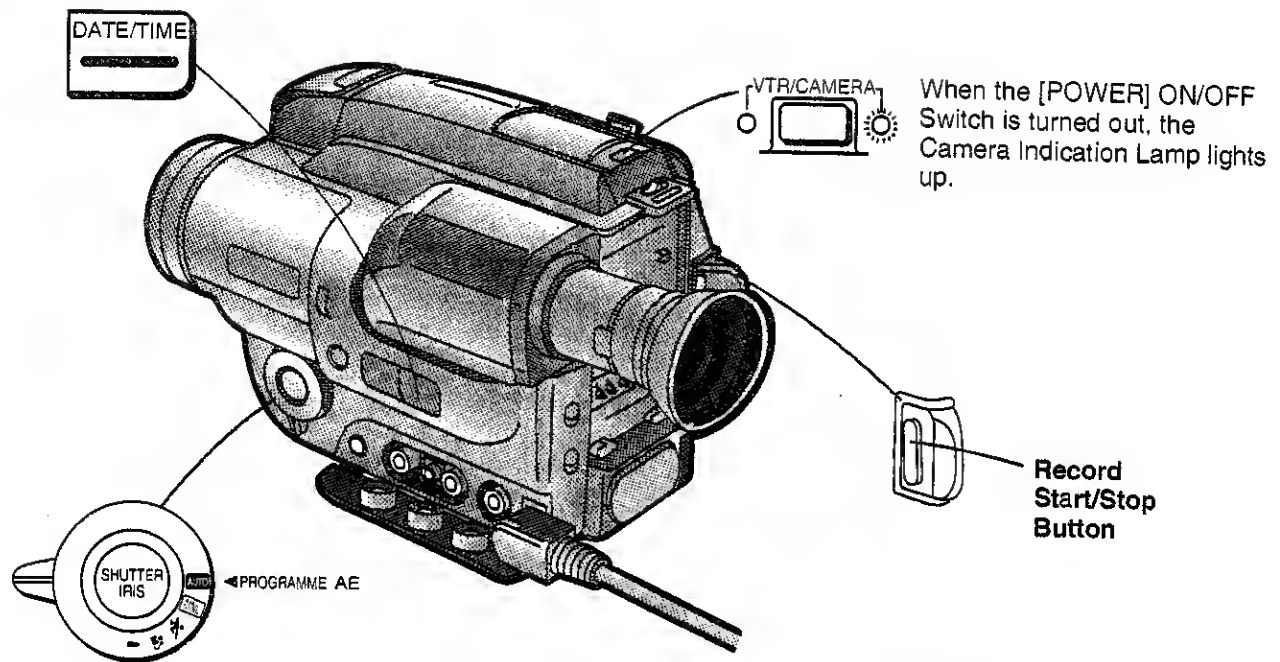


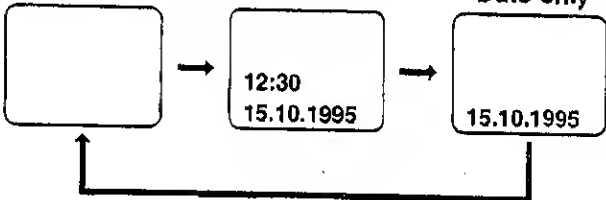

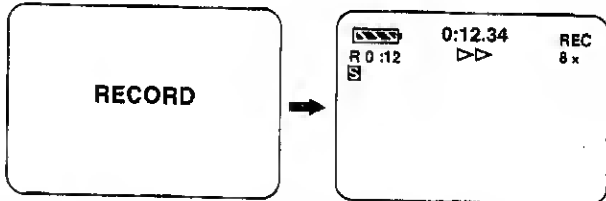
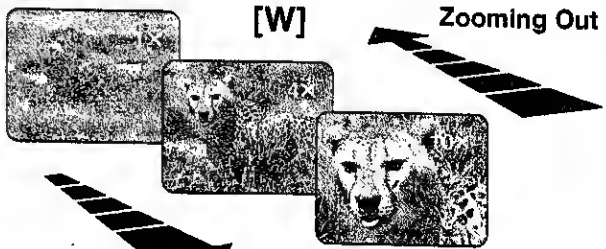
Title	Procedure	
<p>Inserting the Button-Type Battery</p> <p>When the Button-Type Battery (supplied) is not inserted, the "⊗" Indication flashes in the Viewfinder. Insert the Button-Type Battery.</p> <ul style="list-style-type: none"> • Before exchanging the battery, turn the Movie Camera off. 	<p>1</p>  <p>Pull out the Battery Holder while pushing the two stoppers toward each other.</p>	<p>2</p>  <p>Install the Battery with the (+) mark facing downward until it locks with a click.</p>
<p>Setting the Date and Time</p> <p>Before setting, attach the charged Battery Pack or connect the AC Adaptor to the Movie Camera and turn the Movie Camera on.</p> <p>For exsmple: To set the clock to October 15, 1995, 12:30...</p>	<p>1</p>  <p>Press the [DATE/TIME] Button.</p>	<p>2</p>  <p>Keep pressed to make the "Year" portion flash.</p>
	<p>5</p>  <p>Press to set to "10".</p>	<p>6</p>  <p>Press to make the "Day" portion flash.</p>
	<p>9</p>  <p>Press to set to "12".</p>	<p>10</p>  <p>Press to make the "Minute" portion flash.</p>

WARNING

"THE LITHIUM BATTERY" IS A CRITICAL COMPONENT (TYPE NUMBER CR2032 MANUFACTURED BY PANASONIC). IT MUST NEVER BE SUBJECTED TO EXCESSIVE HEAT OR DISCHARGE. IT MUST THEREFORE ONLY BE FITTED IN EQUIPMENT DESIGNED SPECIFICALLY FOR ITS USE. REPLACEMENT BATTERIES MUST BE OF THE SAME TYPE AND MANUFACTURER. THEY MUST BE FITTED IN THE SAME MANNER AND LOCATION AS THE ORIGINAL BATTERY, WITH THE CORRECT POLARITY CONNECTIONS OBSERVED. DO NOT ATTEMPT TO RE-CHARGE THE OLD BATTERY OR RE-USE IT FOR ANY OTHER PURPOSE IT SHOULD BE DISPOSED OF IN WASTE PRODUCTS DESTINED FOR BURIAL RATHER THAN INCINERATION".

		Remarks, etc.
<p>3</p>  <p>Align the "▲" marks and insert the Battery Holder into the Movie Camera.</p>	<p>■ How to Remove the Button-Type Battery</p>  <p>① While pushing, ② remove.</p>	<p>■ Replacing the Button-Type Battery from the Battery Holder</p> <ul style="list-style-type: none"> • The life of the battery is about one year. When the battery becomes exhausted, the "⊙" indication in the Viewfinder starts to flash. Replace the exhausted battery with a new CR2032 Battery.
<p>3</p>  <p>Press to set to "1995".</p>	<p>4</p>  <p>Press to make the "Month" portion flash.</p>	<p>■ Changing the Figures of the Date/Time Indication</p> <p>By pressing the [SET] Button repeatedly, the Date/Time Indication can be changed in the following order.</p> <p>For example:</p> <p>Year: 1990→1991→.....2089→1990→...</p> <p>Month: 1→2→.....→12→1→...</p> <p>Day: 1→2→.....→31→1→...</p> <p>Hour: 0→1→.....→23→0→...</p> <p>Minute: 00→01→.....→59→00→...</p> <ul style="list-style-type: none"> • When the [SET] Button is kept pressed, the figures change more quickly. • If you make a mistake during setting, start again from the beginning.
<p>7</p>  <p>Press to set to "15".</p>	<p>8</p>  <p>Press to make the "Hour" portion flash.</p>	
<p>11</p>  <p>Press to set to "30".</p>	<p>12</p>  <p>Press to start the clock.</p>	



Title	Viewfinder
<p>Inserting and Deleting the Date and Time</p> <p>The Date and Time Indications can be inserted and deleted during filming as well as in the Filming Pause Mode.</p>	<p>No indication Date and Time Date only</p> 
<p>Starting Filming (Recording)</p>  <p>While "INDEX" Indication is visible, an index signal is being recorded. (p. 19)</p>	 <p>For the detailed explanations for each indication in the Viewfinder, see p. 16. Shown above is a typical example of the indications visible when filming in the Auto Mode.</p>
<p>Making the Subject Larger or Smaller During Filming</p> <p>This Function also operates in the Filming Pause Mode.</p> <ul style="list-style-type: none"> • The zoom range extends from 1× to 10×. • In the maximum tele setting, the focus can be adjusted only for subjects at a distance of more than 1.5 m from the lens. 	 <ul style="list-style-type: none"> • The Zoom Magnification Indication in the viewfinder changes.

■ Using the Macro Close-up Function

After keeping the [W•T] Zoom Lever pressed toward "W" to zoom to the maximum wide-angle setting, the subject can be focussed down to a minimum distance of only 5 mm between lens and subject.

- As the depth of field is very small in this mode, even slight camera movements can cause the subject to go out of focus. Therefore, it is recommended to use a tripod (optional).
- When filming pictures in a photo album or a similar situation with insufficient lighting, use a Video DC Light (optional).



When setting the Movie Camera to the Filming Pause Mode, a playback picture may be displayed briefly (for 0.1–0.5 second) in the Viewfinder.

However, this is for reading the VITC value and is not a malfunction.

This occurs in the following cases:

- When the Movie Camera is set to the Filming Pause Mode for the first time after inserting a new video cassette into the Movie Camera.
- When the Movie Camera is set to the Filming Pause Mode by switching back from the VTR Mode to the CAMERA Mode without having performed any playback after fast-forwarding or rewinding the tape.
- When the Movie Camera is set to the Filming Pause Mode for the first time after attaching the Battery Pack (or connecting the AC Adaptor) when the Buton-Type Battery is exhausted.

Procedure

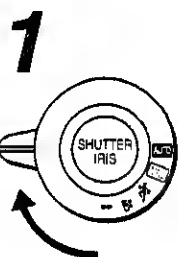


By pressing this button repeatedly, the Date/Time Indication in the Viewfinder can be changed in the left order.
Select the desired indication.

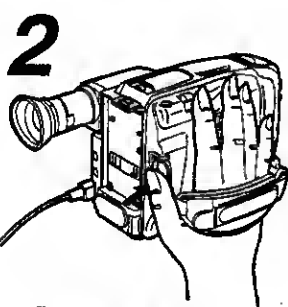
Remarks, etc.

■ Displaying the Data from the Camera Information in the Viewfinder

Even if the date is not displayed in the Viewfinder during filming, it is always recorded as parrots the camera information. It can be checked in the Viewfinder during playback by pressing the [DATE/TIME] Button. In addition, the picture signal which includes the date information is output through the [VIDEO OUT] Socket (p. 50). In this case, the date/time indication will be at the bottom right corner of the picture.



Confirm that the [AE] Dial is set to "AUTO".



Press Record Start/Stop Button.

■ To Pause the Filming

Press the Record Start/Stop Button again. The "PAUSE" Indication appears in the Viewfinder.

- If the Movie Camera is left in the Filming Pause Mode for more than 6 minutes, it will automatically switch off to protect the tape and to conserve battery power.

To resume filming from this condition, turn the [POWER] ON/OFF Switch in (the Movie Camera is switched off) and then turn it out again.

■ To Stop Filming

Turn the [POWER] ON/OFF Switch in.

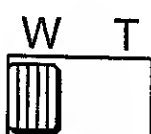
1

■ Zooming In



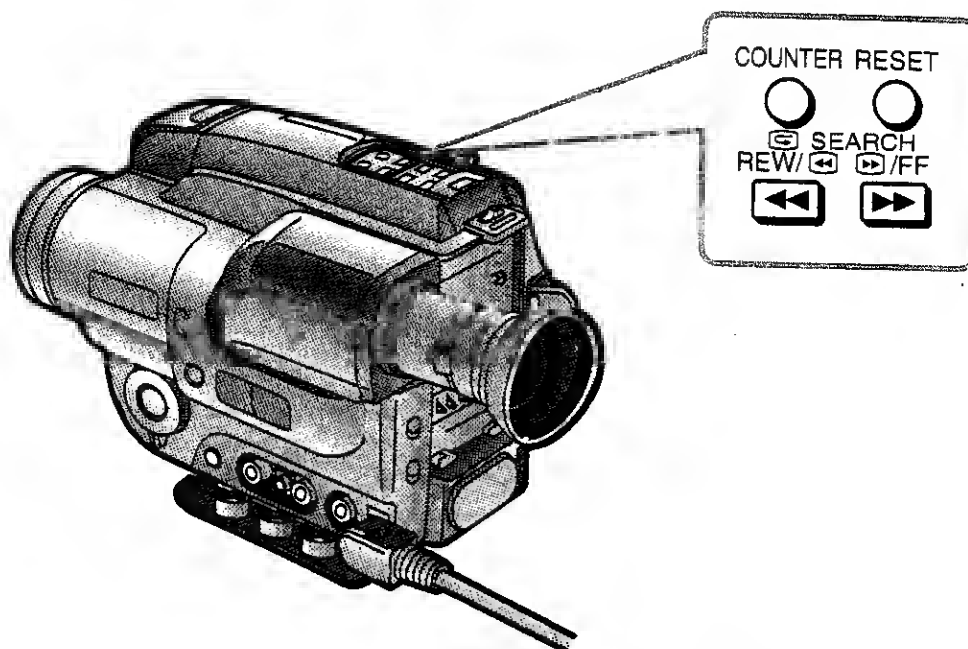
"T" means Tele.

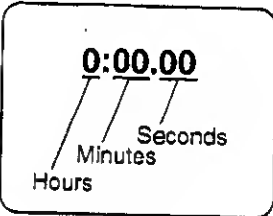

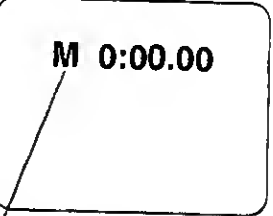

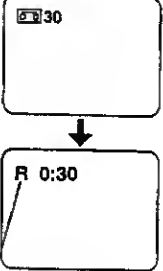
■ Zooming Out



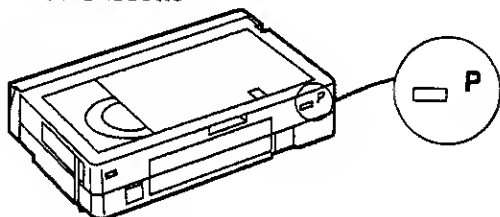
"W" means Wide.

- The zooming speed varies depending on how far the [W•T] Zoom Lever is pushed towards "W" or "T". (The further it is pushed, the faster the zooming speed becomes.)



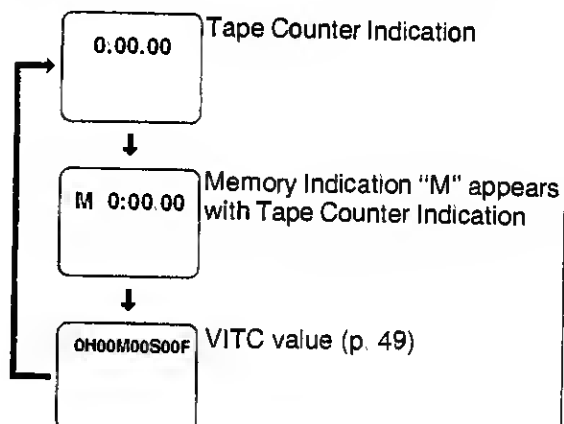
Title	Viewfinder	Procedure
<p>Using the Tape Counter Indication</p> <p>The Tape Counter in the Viewfinder shows the elapsed recording or playback time in hours, minutes and seconds.</p> <p>Resetting the Tape Counter to "0:00.00" by pressing the [RESET] Button before starting to film makes it easy to keep track of the elapsed recording time.</p>	 <p>0:00.00</p> <p>Hours Minutes Seconds</p>	<p>1</p> <p>■ To Reset the Tape Counter:</p> <p>RESET</p> 
<p>Using the Memory Function</p> <p>When the Tape Counter is reset to "0:00.00" at the beginning of the desired scene and the Memory Indication "M" is turned on, the tape will stop automatically at the "0:00.00" position when rewinding or fast-forwarding it.</p>	 <p>M 0:00.00</p> <p>Means: Memory</p>	<p>1</p> <p>■ To Make the "M" Indication Appear:</p> <p>COUNTER</p> 
<p>Confirming the Remaining Tape Time</p> <p>During filming and playback, the Remaining Tape Time is displayed in minutes instead of the Tape Length Indication "30" or "45".</p> <p>Note: This function is only meant as a guide. The "time remaining" Indication is subject to change due to either customer error such as; wrong tape size selected or tape stretch.</p>	 <p>30</p> <p>R 0:30</p> <p>Means: Remaining</p>	

Video Cassette



When using a video cassette carrying the "P" mark or an S-VHS-C video cassette, the Remaining Tape Counter Indication may not be very precise.

At every press of the [COUNTER] Button, the Counter Indication will change as follows:

*Remarks, etc.*

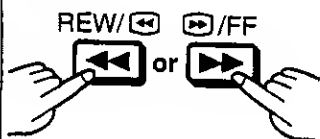
- The Tape Counter Indication does not change during playback of tape on which recording has never been made.
- Taking out the Cassette or removing the Battery Pack automatically resets the Tape Counter Indication to "0:00.00".
- When the tape is rewound further than the tape counter position "0:00.00", the minus sign "-" appears in front of the Tape Counter Indication.

2

■ To Reset the Tape Counter:



3

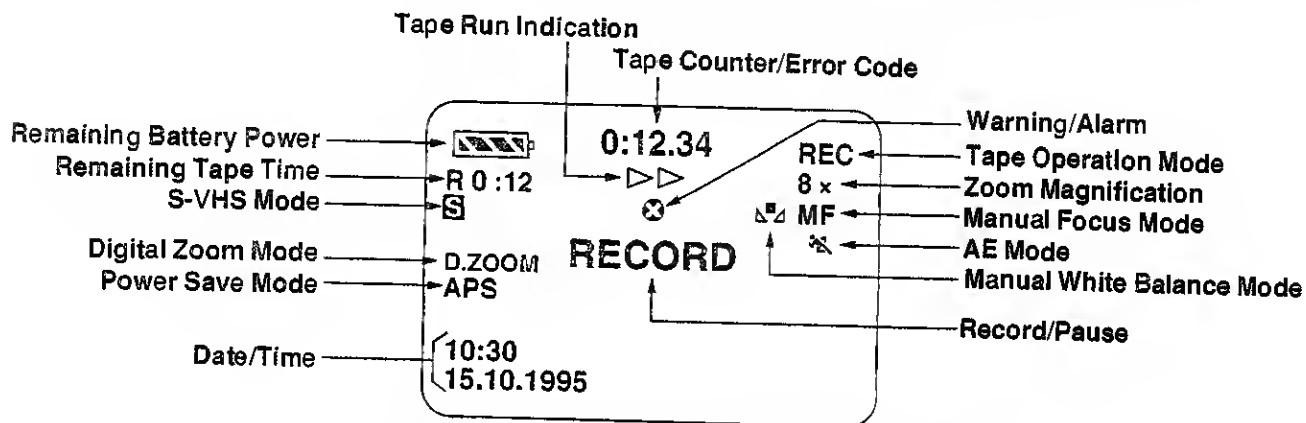


- It is not possible to reset the VITC Counter with the [RESET] Button (p. 49).

- The Remaining Tape Time is not displayed until filming or playback is started.
- While the Movie Camera calculates the Remaining Tape Time, the "R" Indication flashes in the Viewfinder.
- When the Remaining Tape Time becomes less than 2 minutes, the Indication "R" and the Remaining Tape Time start to flash.
- To ensure precise indication of the Remaining Tape Time, be sure to set the Tape Length Indication that matches the video cassette being used before starting to film (p. 32).

Quick Reference Guide to the Indications in the Viewfinder

The following indications are displayed in the Viewfinder to inform you about the condition of the Movie Camera.

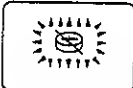




• The illustrations in the following explanations show only the indication(s) pertaining to the corresponding explanation.

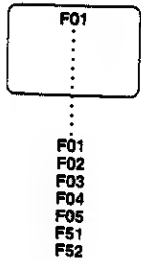
1 Warning/Alarm Indications

Viewfinder	Condition	Page
	Condensation Condensation has formed inside the Movie Camera. Wait until the "U 10/ " Indication disappears.	56
	Video Head Clogging The video heads are dirty.	55
	Remaining Battery Power The 4 segments of the Remaining Battery Power Indication begin to disappear one after another as the power of the Battery Pack weakens. When only the last segment remains, the " " Indication starts to flash in the centre of the Viewfinder. When the last segment has disappeared, the "CAMERA" Indication Lamp flashes for a few seconds, and then the Movie Camera automatically switches itself off. Replace the exhausted Battery Pack with a fully charged one.	24
	Tape When no video cassette is inserted or when the tab of the inserted video cassette is broken out, this indication flashes. Insert a video cassette with intact tab.	8, 53

1 Warning/Alarm Indications (cont.)






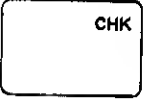

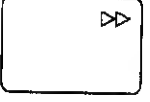

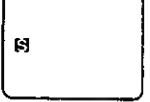
Viewfinder	Condition	Page
	Button-Type Battery When no Button-Type Battery is inserted, or when the inserted battery is exhausted. Insert a new Button-Type Battery (CR2032).	11
	End of the Tape When the tape has reached its end during filming, this indication appears. Insert a new cassette.	—
	Anti-Ground-Filming When the Movie Camera is tilted more than about 70° from its normal horizontal position during filming (with the [POWER SAVE] Switch set to "ON"), the Movie Camera automatically switches over to the Filming Pause Mode. If the Movie Camera is then returned to its normal horizontal filming position, the "CHK" Indication will flash in the Viewfinder.	44



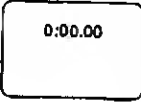
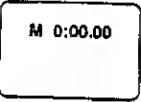
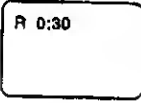
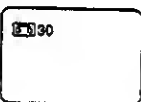
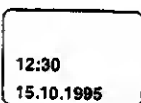
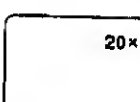
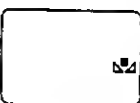

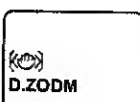
2 Error Code Indications

Viewfinder	Condition	Page
	Error Code When the "F" Indication appears in the Viewfinder, some malfunction has occurred. If the indicated error code is between "F01" and "F05", the Movie Camera will turn itself off automatically one minute after the "CAMERA" Lamp has started to flash. (When the indication is "F51" or "F52", the Movie Camera will not turn off automatically.) In this case, write down the error code and tell it to the service personnel.	—

Quick Reference Guide to the Indications in the Viewfinder (cont.)

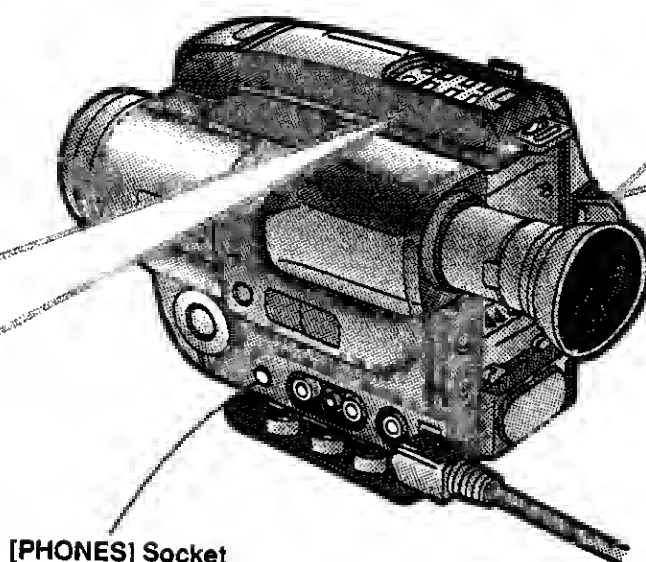
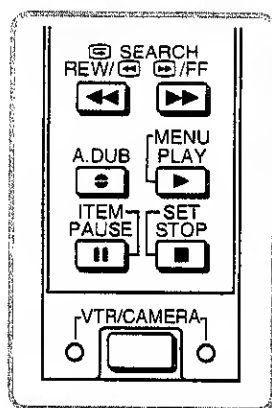
3 Filming/Playback Indications

Viewfinder	Condition
	Filming Mode (large indication) (p. 12) When the Start/Stop Button is pressed from the Filming Pause Mode, this indication is displayed for approx. 1 second.
	Filming Mode (small indication) (p. 12) REC means Recording.
	Tape Run Indication (p. 12)
	Filming Pause Mode (large indication) (p. 13) When the Start/Stop Button is pressed from the Filming Mode, this indication is displayed for approx. 1 second.
	Filming Pause Mode (small indication) (p. 13)
	Recording Review Mode (p. 42) "CHK" means Check.
	Playback/Search Mode (p. 21, 43)
	Fast Forward/Cue Mode (p. 20)
	Rewind/Review/Search Mode (p. 20, 42)
	S-VHS Format (p. 33)

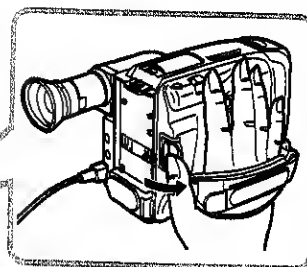
Viewfinder	Condition
	Hi-Fi Mode During playback of Hi-Fi sound, the "Hi-Fi" Indication is displayed in the Viewfinder.
	Still Playback Mode (p. 21)
	Tape Counter (p. 14)
	Tape Counter with activated Memory Function (p. 14) "M" means Memory.
	Remaining Tape Time (p. 14) "R" means Remaining.
	Tape Length (p. 32) The Tape Length Indication can be selected with the Menu Mode.
	Date and Time (p. 12)
	Zoom Magnification (p. 12, 38) When zooming in on a subject, the indicated zoom magnification value increases.
	Manual White Balance Mode (p. 29)
	Manual Filming Mode (p. 28) MNL means Manual.
	Digital Image Stabilizer Mode (p. 38) The "D.ZOOM" Indication appears, too.

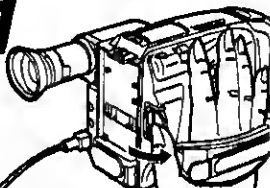


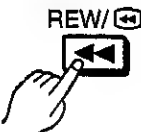


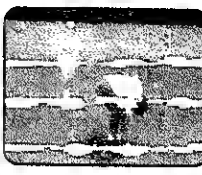
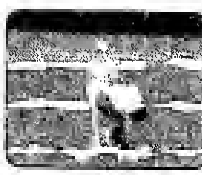
Viewfinder	Condition
	Digital Gain-up Mode (p. 38) When the sensitivity is increased to 8 times, the "GAIN8x" Indication appears.
	Digital Mix Mode (p. 40) The "MIX" Indications displayed when a still picture is in the digital memory.
	Digital Wipe Mode (p. 40) The "WIPE" Indication is displayed when a still picture is in the digital memory.
	Snapshot Mode (p. 32)
	Sports Mode (p. 34) This Indication is displayed when the Sports Mode has been selected.
	Portrait Mode (p. 34) This Indication is displayed when the Portrait Mode has been selected.
	Low Light Mode (p. 34) This Indication is displayed when the Low Light Mode has been selected.
	Manual focus Mode (p. 26) "MF" means Manual Focus.
	Audio Dubbing Mode (p. 50)
	Audio Dubbing Pause Mode (p. 50)
	Menu Mode (p. 32) This Indication is displayed when pressing the [MENU/PLAY] Button.

Viewfinder	Condition
	VITC "DR-ON" Mode (p. 49) The "DR" Indication is displayed when selecting "DR-ON" for the "VITC" in the Menu Mode.
	VITC and Camera Information (p. 50)
	Shutter Speed/Iris Value (p. 36)
	Power Save Mode (p. 44) This Indication is displayed when the [POWER SAVE] Switch set to "ON".
	Index Signals (VISS) (p. 12) The "INDEX" Indication appears briefly in the Viewfinder while an index signal is being recorded. The index signals make possible the use of the VHS Index Search or Intro Scan Function when playing back the tape on a VTR equipped with these functions. An index signal is recorded automatically in the following cases: <ul style="list-style-type: none"> ●When recording is started for the first time after attaching the Battery pack. ●When recording is restarted after exchanging the cassette or after pressing the [VTR/CAMERA] Button.


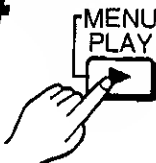

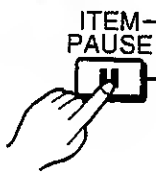
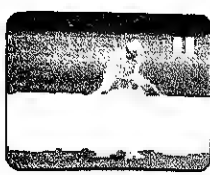


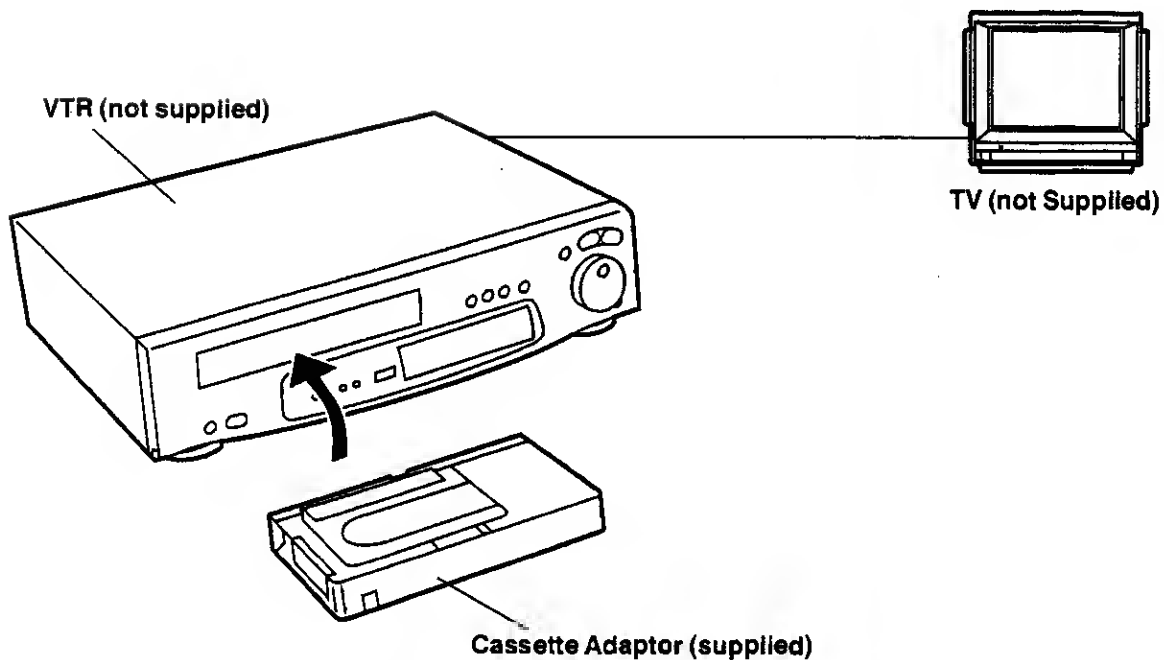
[PHONES] Socket

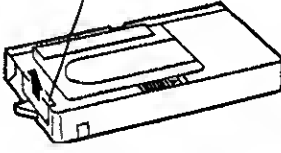
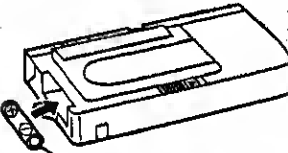
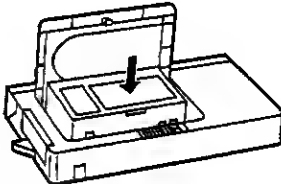
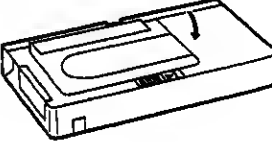


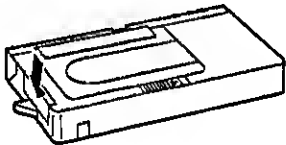
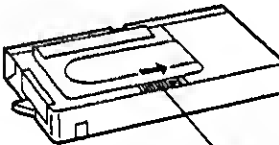
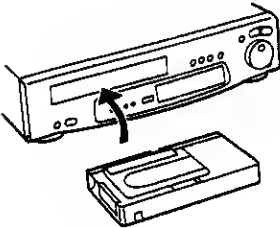

Title	Procedure	
<p>Playing Back on the Viewfinder or the TV</p> <p>[To Play Back Via TV Set]</p> <ol style="list-style-type: none"> 1. Connect the Movie Camera to a TV set. (p. 6) 2. Follow steps 1 through 4 opposite. 	<p>1</p>  <p>Turn Power ON/OFF switch out.</p>	<p>2</p>  <p>The "VTR" Indication Lamp lights up.</p>
<p>Rewinding or Fast-Forwarding the Tape</p> <p>Perform these operations with the Movie Camera in the VTR Stop Mode ("VTR" Indication Lamp is lit).</p>	<p>■ For Fast-Forward</p> 	<p>■ For Rewind</p> 
<p>Using the Cue, Review and Still Playback Functions During Normal Playback</p>	<p>■ For Cue Playback</p>  <p>Keep pressed.</p>	<p>■ For Review Playback</p>  <p>Keep pressed.</p>
	<p>Cue Playback Mode</p> 	<p>Review Playback Mode</p> 

To be able to enjoy playback with the recorded sound connect stereo headphones (optional) to the [PHONES] Socket. (When playing back a cassette tape on which audio dubbing has been performed, refer to p. 50.)

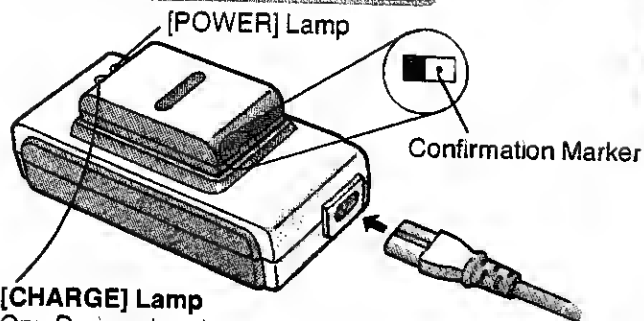
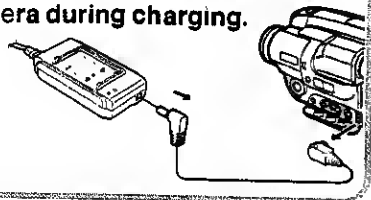
		Remarks, etc.
<p>3</p>  <p>REW/⏮</p> <p>The tape will stop automatically when it reaches the beginning.</p>	<p>4</p>  <p>MENU PLAY</p>	<p>As this Movie Camera is equipped with TBC, it is highly suited as a playback unit for editing.</p> <ul style="list-style-type: none"> When the tape reaches its end during playback, it will be rewound automatically. <p>■ To Stop the Playback Press the [STOP] Button.</p>
		<ul style="list-style-type: none"> When the tape reaches its end during Fast-Forward, it will be rewound automatically. When the tape reaches the beginning during Rewind, it will stop automatically.
<p>■ For Still Playback</p>  <p>ITEM PAUSE</p>	<p>To return to normal playback</p>  <p>ITEM PAUSE</p>	<ul style="list-style-type: none"> The sound will be played back only during normal playback. In the Cue, Review and Still Playback Modes, horizontal noise bars appear in the picture, or the picture may become black and white or distorted. However, this is normal and not a malfunction. If the Movie Camera is left in the Still Playback Mode for about 6 minutes, it will switch over to the Stop Mode to protect the tape and the video heads.
<p>Still Playback Mode</p> 		



Title	Procedure	
<i>Playing Back on VTR, use the Supplied Cassette Adaptor</i>	1  Battery Compartment Cover Remove the Battery Compartment Cover.	2  Supplied battery (R6) Insert the Battery (R6).
	5  Insert the recorded video cassette.	6  Close the Top Cover.

		Remarks, etc.
<p>3</p>  <p>Re-attach the Battery Compartment Cover.</p>	<p>4</p>  <p>Open Lever</p> <p>Slide the Open Lever.</p>	<ul style="list-style-type: none"> • For optimum picture quality, it may be necessary to adjust the tracking control on the VTR. • Never insert the empty Cassette Adaptor (without a video cassette) into a VTR. • Do not insert the Cassette Adaptor into a VTR and take it out again without running the tape, because this could loosen the tape. • When loading the video cassette into the Cassette Adaptor, do not touch the tape directly. • After use, take the video cassette out from the Cassette Adaptor. • When using an S-VHS-C video cassette that you want to play back on a standard VHS VTR (carrying the VHS logo), be sure to set the Movie Camera to the VHS mode. If an S-VHS recording is played back on a standard VHS VTR, the picture will be totally distorted. A standard VHS VTR that also carries the "SQPB" logo (S-VHS-Quasi Playback), on the other hand, is capable of playing back S-VHS recordings.
<p>7</p>  <p>Insert the Cassette Adaptor into the VTR.</p>	<p>8</p>  <p>Operate the VTR.</p>	

Do not connect the Movie Camera during charging.

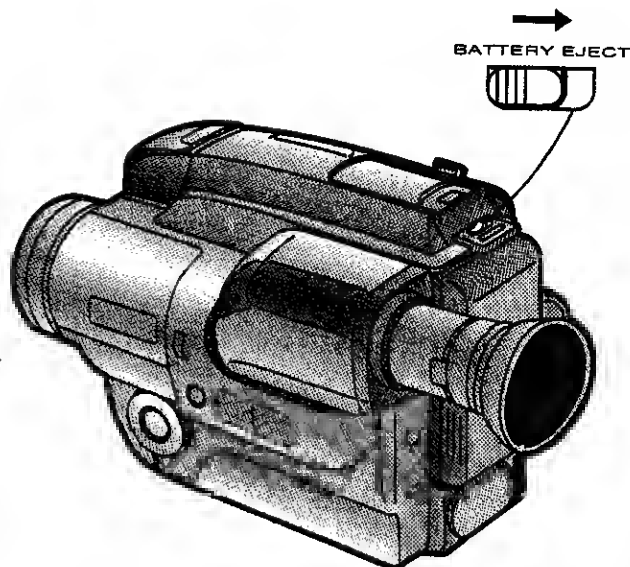


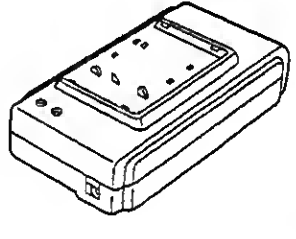


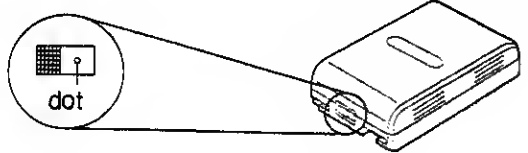
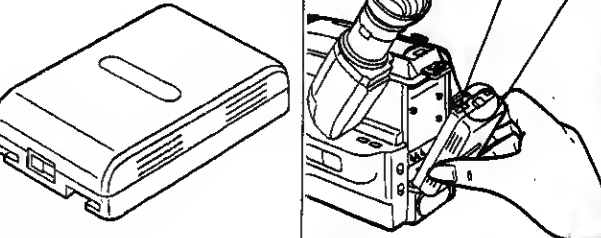
[CHARGE] Lamp

On: During charging.

Off: Charging is finished.

(For maximum charge, continue charging for 2 hours after the [CHARGE] Lamp has gone off.)



Title	Procedure
<p>Charging the Battery Pack</p> <ul style="list-style-type: none"> • Be sure to insert the mains plug completely into the correct socket. • Do not connect the DC Input Cable to the AC Adaptor otherwise the Battery Pack cannot be charged. 	<p>1</p>  <p>Attach Battery.</p>
<p>Attaching the Charged Battery Pack</p>  <p>If an exhausted Battery Pack is attached, the "  " Indication in the Viewfinder flashes, when turning the Movie Camera on.</p> <p>Charging Confirmation Marker Use this marker to distinguish between charged and discharged Battery Packs. For example, slide the Button so that the dot is visible after charging is completed.</p> 	<p>1</p>  <p>Attach the Battery Pack with its Confirmation Marker facing upward.</p>

Cautions for Use

- When the operation time even after correct charging is too short for normal use, the service life of the Battery Pack has reached its end.
- Do not try to disassemble or reconstruct Battery Pack.
- Do not throw the exhausted Battery Pack into a fire.
- Make sure that no metal objects touch the contacts of the Battery Pack.
- Do not recharge the Battery Pack when it is already fully charged.
- During filming or during recharging, the Battery Pack may become warm, this is not a malfunction.

2



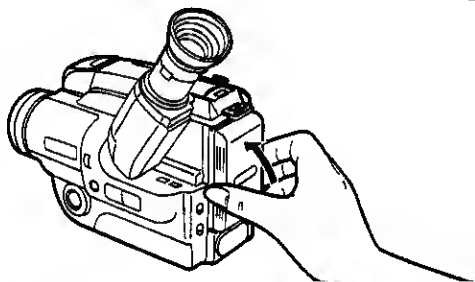
Plug Into AC Adaptor.

Plug into AC mains outlet.

■ Removing the Battery Pack

Slide it in the opposite direction to step 1.

2



■ Removing the Battery Pack

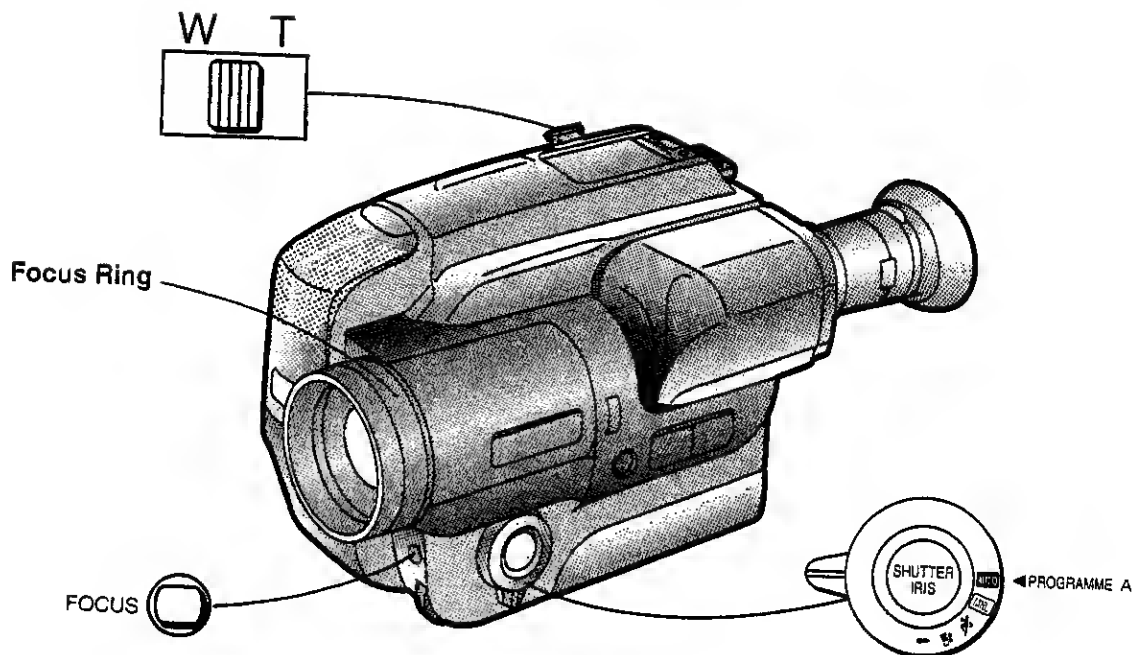
BATTERY EJECT

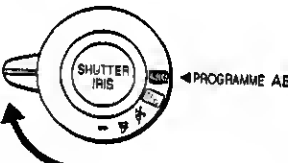
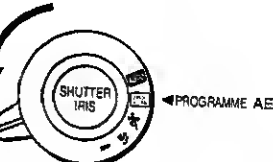

When sliding down the Lever, be sure to hold the Battery Pack, to prevent it from dropping.

Remarks, etc.

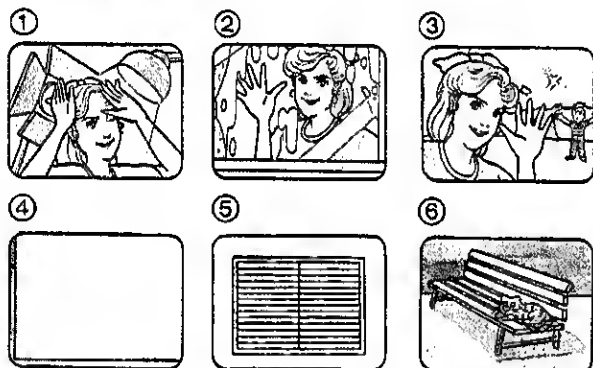
Battery Pack No.	Charging Time	Max. Filming Time
Supplied	Approx. 65 min.	Approx. 40 min.
VW-VBS10E	Approx. 65 min.	Approx. 40 min.
VW-VBS20E	Approx. 130 min.	Approx. 80 min.
VW-VBH10E	Approx. 80 min.	Approx. 50 min.
VW-VBH20E	Approx. 160 min.	Approx. 100 min.

- The figures in the table above are based on an ambient temperature of 25°C.
- Charge the Battery Pack at an ambient temperature between 10°C and 35°C.
The Battery Pack's ability to generate electric energy is based on a chemical reaction. This reaction can take place better at high temperatures. Therefore, when filming at low ambient temperature, the maximum filming time may be considerably shorter than listed.
- To recharge a Battery Pack whose operation time has become too short for practical use, or which has been stored for a long period of time.
Continue charging for 24 hours even after the Charging Lamp on the AC Adaptor goes out.
(If this does not result in an operation time close to those shown in the table, the service life of this Battery Pack has reached its end. Replace it with a new one.)
- Never remove the Battery Pack during recording or playback, because the tape will remain in contact with the video heads and this could cause damage to the heads and tape.
- When the Battery Pack has become exhausted and the Movie Camera has turned off automatically, remove the Battery Pack before connecting the DC Input Cable of the AC Adaptor to the Movie Camera, otherwise the Movie Camera cannot be turned on.



Title	Procedure	
<p>Filming with the Auto Focus Mode</p> <p>When the [AE] Dial is set to "AUTO", the Movie Camera will automatically focus precisely on almost any subject located in the centre of the Viewfinder.</p> <ul style="list-style-type: none"> • If you want to film with automatic focussing in one of the other settings of the [AE] Dial, press the [FOCUS] Button to make the "MF" indication in the Viewfinder disappear. 	<p>1</p> 	
<p>Filming with the Manual Focus Mode</p>	<p>1</p>  <p>The "MNL" indication appears in the Viewfinder.</p>	<p>2</p>  <p>The "MF" indication appears in the Viewfinder.</p>

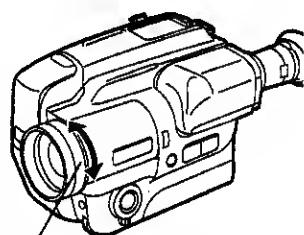
In the following filming situations, use the Manual Focus Mode:



Remarks, etc.

- ① A subject with shiny surfaces or much light reflection
 - ② A subject behind glass that is covered with dirt, dust or water drops
 - ③ A subject with a part of it near the Movie Camera and another parts far away from it.
 - ④ A flat surface, e.g. a white wall
 - ⑤ A subject with horizontal stripes
 - ⑥ An oblique subject
- A fast-moving subject
 - A subject with a dark surface
 - When using the Macro Close-up Function, special lenses or filters

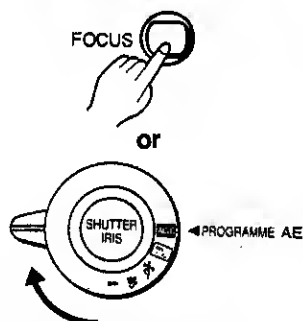
3



Focus Ring

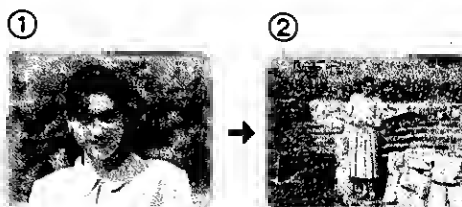
Adjust the Focus Ring until the subject is in focus.

To Cancel the Manual Focus Mode



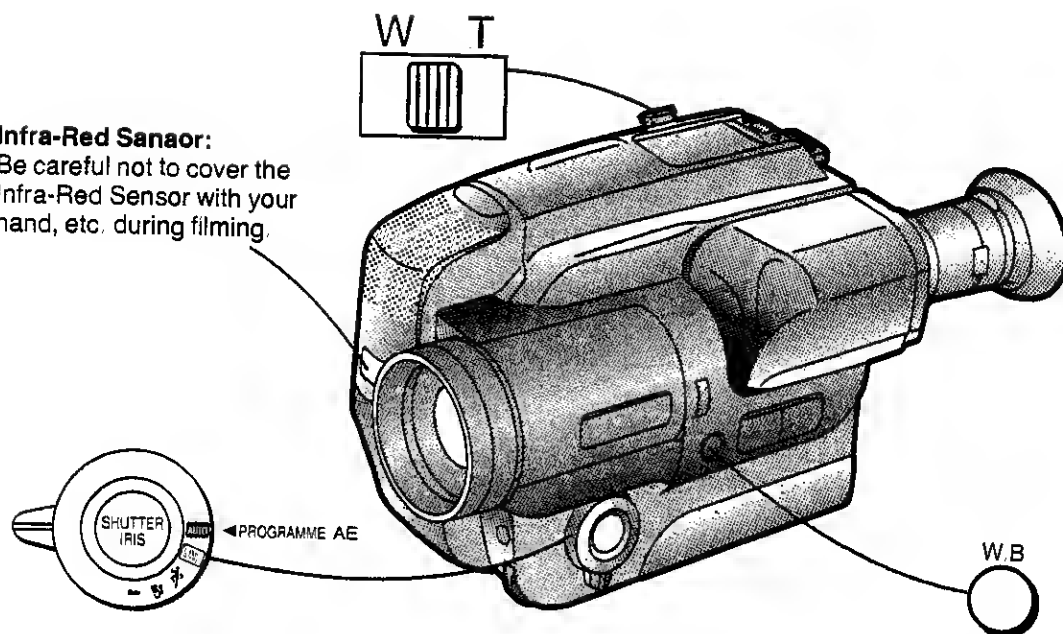
Press the [FOCUS] Button to make the "MF" Indication disappear. Or reset the [AE] Dial to "AUTO".

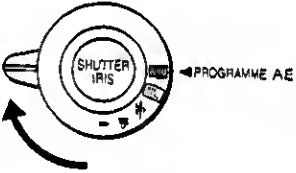
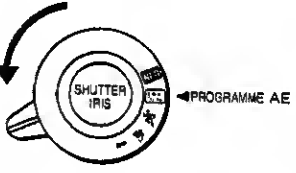
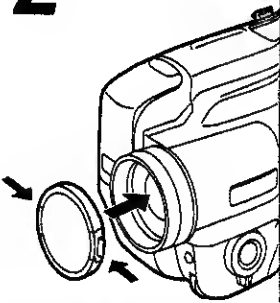
Hints for Manual Focus Adjustment


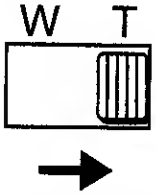
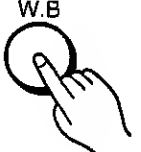


- ① Be sure to adjust the focus after zooming in on the subject.
- ② Adjusting the focus with the lens zoomed in on the subject assures precisely focussed pictures even when subsequently zooming back.
 - If the focus is adjusted with the lens in the wide-angle setting, the subject may go out of focus when zooming in on the subject.

Infra-Red Sensor:
Be careful not to cover the
Infra-Red Sensor with your
hand, etc. during filming.



Title	Procedure	
<p>Filming with Automatic White Balance Adjustment</p> <p>When the [AE] Dial is set to "AUTO", it is possible to film pictures with natural colours under almost any filming condition.</p> <ul style="list-style-type: none"> • If you want to film with automatic white balance adjustment in one of the other settings of the [AE] Dial, press the [W.B] Button to make the "W.B" indication in the Viewfinder disappear. 	<p>1</p> 	
<p>Filming with Manual White Balance Adjustment</p> <p>If there is only one light source: Follow the operation steps 1~4 on the right.</p> <p>Nota: If there are several light sources or if the illumination is weak: In operation step 2, instead of attaching the Lens Cap, point the Movie Camera at a pure white subject.</p>	<p>1</p>  <p>The "MNL" indication appears in the Viewfinder.</p>	<p>2</p>  <p>Attach the Lens Cap. or Point the Movie Camera at a pure white subject.</p>





	Remarks, etc.
<p>In the following filming situations, film with Manuel White Belence Adjustment:</p> <div data-bbox="38 959 623 1142">  </div>	<ol style="list-style-type: none"> ❶ When filming under mercury-vapor, natrium or some types of fluorescent lamps etc. ❷ When intense lighting is used, e.g. spot lights in a theatre or when the colour temperature of the light source is low. ❸ When filming at sunrise or sunset. <ul style="list-style-type: none"> • When filming with an ND Filter (optional) or a Conversion Lens (optional).
<p>3</p> <div data-bbox="69 1649 223 1843">  </div> <p>Keep pushed until the Viewfinder becomes completely white.</p>	<p>4</p> <div data-bbox="469 1649 608 1800">  </div> <p>Press for more than 1 second.</p> <ul style="list-style-type: none"> • Under weak illumination, Manual White Balance Adjustment may not be possible. In this case, film in the "AUTO" Mode. • If an additional light source with low colour temperature (e.g. halogen lamp) is used momentarily while filming a subject with high colour temperature (e.g. blue sky or TV screen), unnatural colours will result. • The manually adjusted white balance setting will be maintained until it is cancelled. However, to ensure optimum colour reproduction, it is recommended to adjust the white balance for each new scene. • When the Manual White Balance Adjustment is finished, the "W.B." Indication remains lit in the Viewfinder. <p>■ To Cancel the Manual White Balance Mode Press the [W.B.] Button one time. Or reset the [AE] Dial to "AUTO".</p>

Colour Temperature and White Balance

The colour temperature of the light source is measured in Kelvin.

The higher the Kelvin value is, the more bluish is the light; the lower the value, the more reddish is the light. This is not directly related to the brightness.

The table shows the relationship between natural light, artificial light and colour temperature.

Title	Natural Light	Colour
<p>Colour Temperature and White Balance</p> <p>The colour temperature of the light source is measured in Kelvin.</p> <p>The higher the Kelvin value is, the more bluish is the light; the lower the value, the more reddish is the light. This is not directly related to the brightness.</p> <p>The table shows the relationship between natural light, artificial light and colour temperature.</p>	<p>• Blue sky</p>	<p>10,000 K</p>
	<p>• Slightly overcast sky</p> 	<p>7,000 K~ 8,000 K</p>
	<p>• Cloudy sky (Rain)</p> 	<p>6,000 K</p>
	<p>• Sunlight</p> 	<p>5,000 K</p>
	<p>• 1~2 hours after sunrise or before sunset</p>	<p>3,000 K~ 4,200 K</p>
	<p>• Sunrise or sunset</p> 	<p>2,000 K~ 2,500 K</p>

■ Video DC Light VZ-LDCS13E

This Video DC Light is recommended for filming in a dark room as well as for filming photographs and pictures with the Macro Close-up function (p. 13).

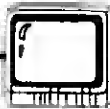
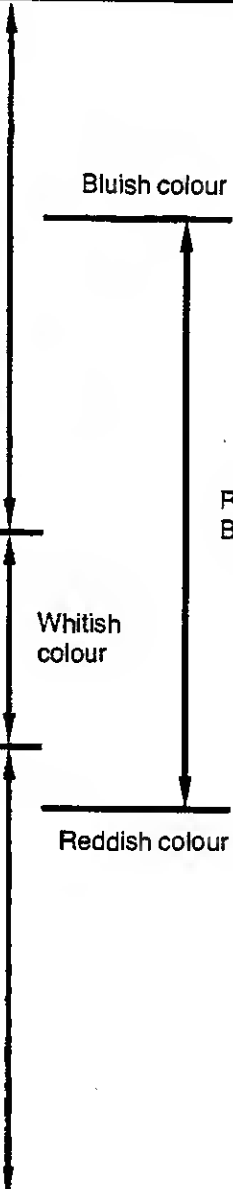
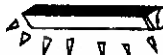
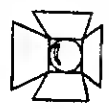



To attach the Video DC Light (VZ-LDCS13E) to the Movie Camera, the Shoe Adaptor (VW-SK9E) is necessary.

■ Filter Kit VW-LF37E

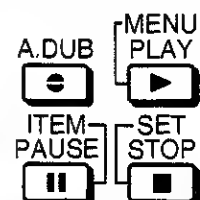
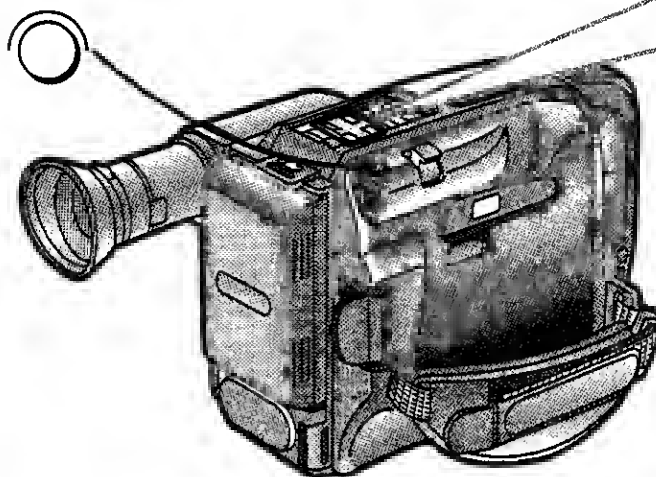
The Filter Kit VW-LF37E contains an ND Filter and an MC Protector.

The ND Filter is recommended for filming in extremely bright places, e.g. on a beach or ski slope. It prevents the picture from becoming whitish, yet without changing the colours. (When filming with the ND Filter attached, the Manual White Balance Adjustment Mode should be used, since Auto White Balance Adjustment Mode would not work normally.)

The MC Protector is used for protecting the lens.

Temperature	Artificial Light	White Balance Adjustment
8,000 K~ 9,000 K	•TV screen 	
4,800 K	•Fluorescent lamp (white) 	
2,500 K~ 3,500 K	•Fluorescent lamp (not white) or studio lamp 	
2,000 K~ 2,800 K	•Halogen light bulb 	
2,000 K~ 2,500 K	•Tungsten lamp 	
1,500 K~ 2,000 K	•Candle-light 	

SNAPSHOT
REC



Title

Viewfinder

Using the Menu Function

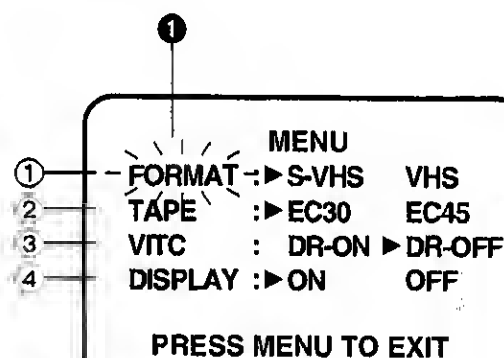
•The Menu Function is used to select the items shown in the Viewfinder in the right.

- ①: For selecting the VHS mode or S-VHS mode
- ②: For selecting "EC30" or "EC45" according to the video cassette being used.
- ③: For selecting the user code system for the VITC. (p.49)

- ④: **For turning the On-Screen Display function on or off:**

When set to "ON", all Indications will appear in the Viewfinder.

When set to "OFF", only the Warning/Alarm Indications and the Tape Running Indications will appear in the Viewfinder.



(Menu Indication)

•The above Menu screen is shown with the original factory settings.

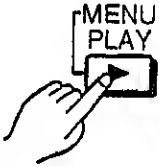
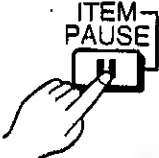



Filming a Still Picture for 5 Seconds (Snapshot)

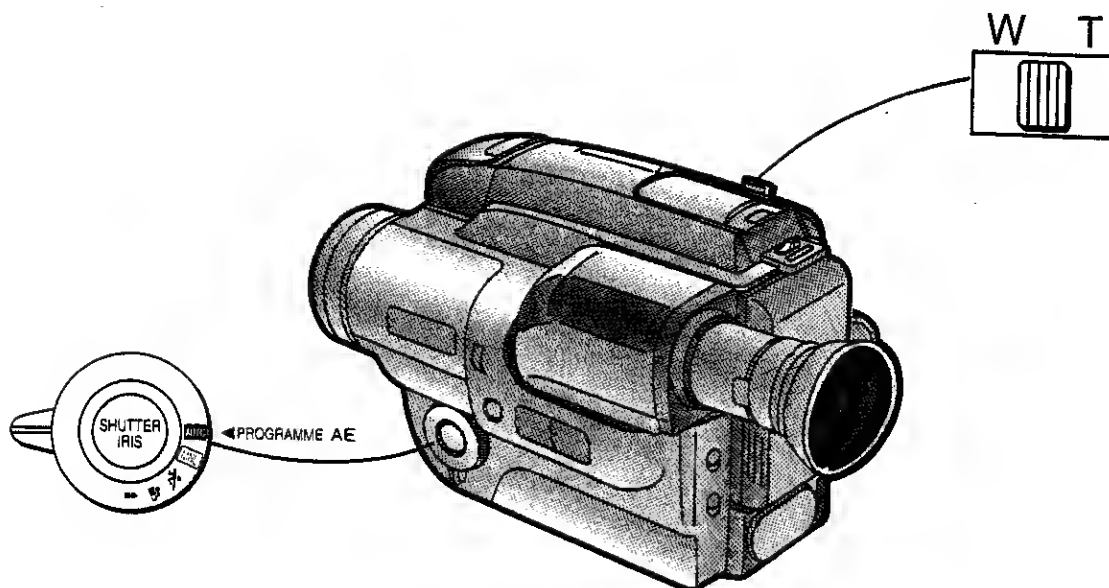
Recording a still picture for approx. 5 seconds can be performed by pressing a single button in the Filming Pause Mode.

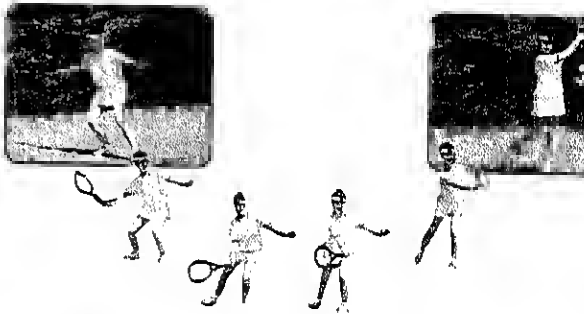
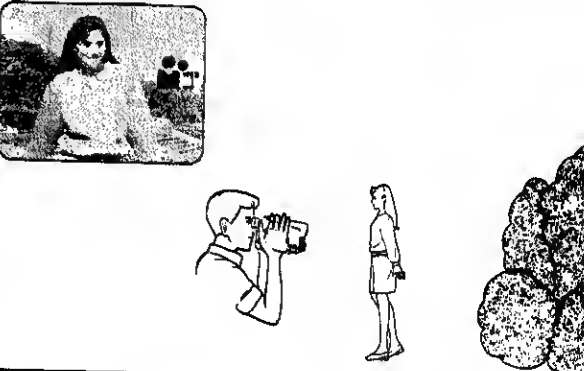
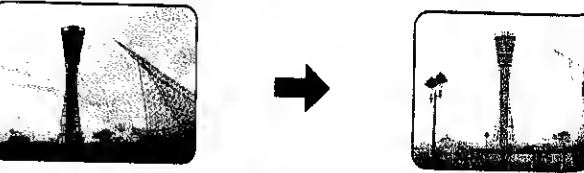
(When using this function repeatedly, wait at least 2 to 3 seconds before pressing this Button again.)



•The picture in the Viewfinder stands still, too.

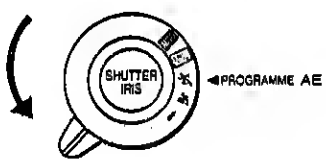
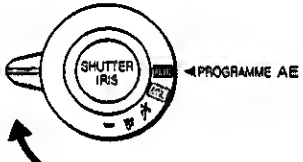
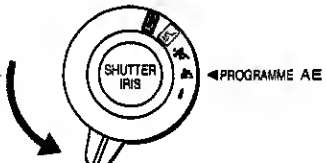
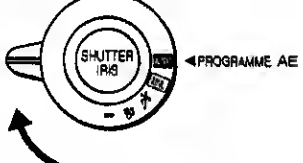
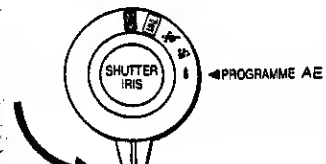
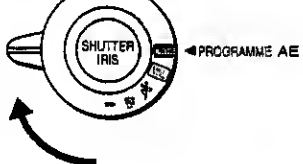
Procedure		Remarks, etc.
<p>1</p>  <p>Press the Button while in the Filming Pause Mode.</p>	<p>2</p>  <p>Press and select. •The item Indication ① flashes.</p>	<ul style="list-style-type: none"> •While the Menu is displayed, filming is not possible. •The selections made on the Menu screen will be maintained even when the Movie Camera is turned off. •It is possible to display the Menu on the TV screen. (For the connection to a TV set, see page 46.) •When the S-VHS mode is selected, the indication "S" is displayed in the Viewfinder. (However, when a normal VHS-C video cassette is inserted in the Movie Camera, the indication "S" does not appear, because recording in the S-VHS mode is not possible on a normal VHS-C video cassette.) •If the "DR-ON" setting has been selected for VITC, taking out the Button-Type Battery will automatically reset it to "DR-OFF".
<p>3</p>  <p>Press and select with "▶" Mark.</p>	<p>4 To Return to the Normal Filming Mode</p> 	
<p>1</p>  <p>Press while in the Filming Pause Mode.</p>		
		<ul style="list-style-type: none"> •Since the still picture is recorded from the image memory, the picture quality may be slightly inferior to that of normally recorded pictures. •To prevent picture distortion, do not move or shake the Movie Camera during still picture filming. •While the Digital Wipe Function or the Digital Mix Function is activated, this function cannot be operated. •If the Viewfinder has been turned off by the Auto Power Save Function, the Snapshot Function cannot be activated.

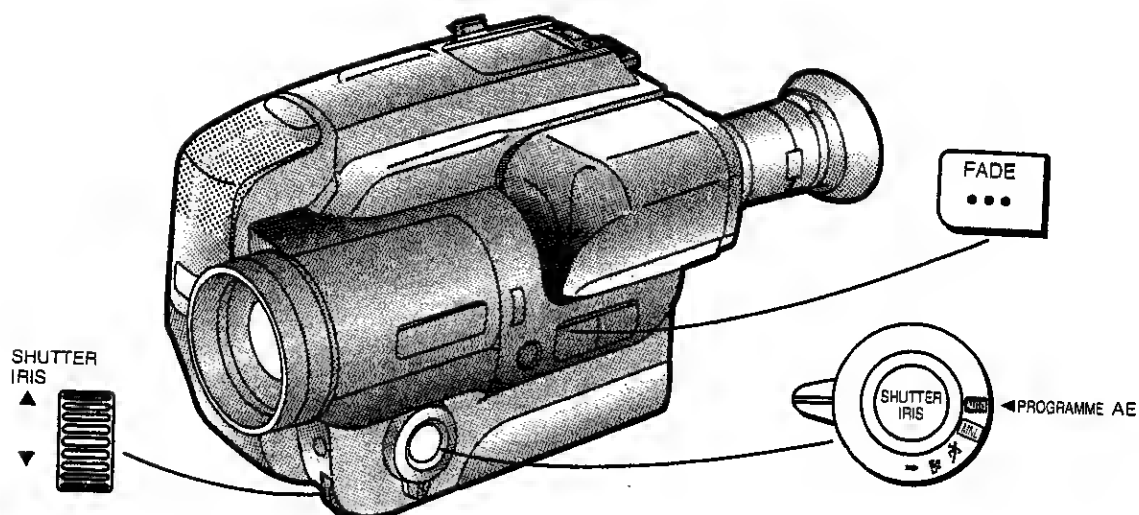


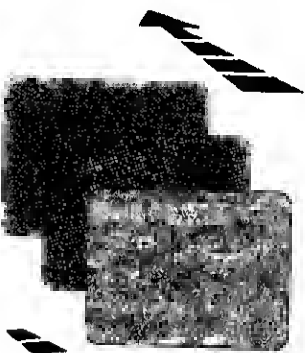
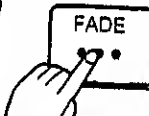
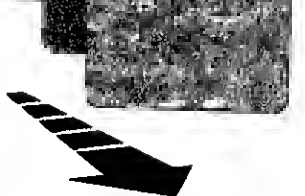

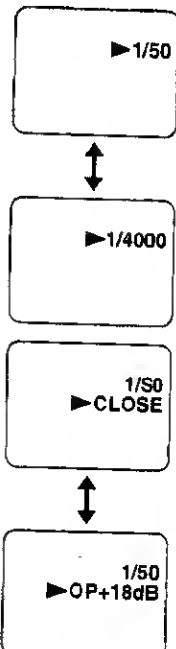
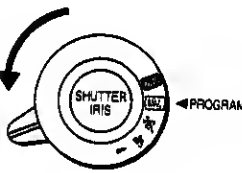
Title	Viewfinder
<p>Filming Fast-Moving Subjects</p> <p>■ Using the Sports Mode This function makes it possible to obtain pictures with minimized blur when filming fast-action scenes such as tennis or other types of sports. When scenes recorded with the Sports Mode are later played back on a VTR, still and slow motion playback with very sharp picture contours and brilliant details can be obtained.</p>	 <p>A sequence of four small viewfinder images showing a tennis player in various stages of a serve, illustrating the Sports Mode's ability to capture fast action with minimal blur.</p>
<p>Making People Stand out Sharply from the Background</p> <p>■ Using the Portrait Mode In the Portrait Mode, the Iris is automatically set to its maximum opening which results in a very small depth-of-field. This causes the subject in the center of the picture to be sharply focussed while the background is blurred.</p>	 <p>A sequence of three small viewfinder images. The first shows a woman's face in sharp focus with a blurred background. The second shows a person taking a photo. The third shows a person standing next to a large, textured rock formation, all demonstrating the shallow depth of field in Portrait Mode.</p>
<p>Filming Dark Scenes More Brightly</p> <p>■ Using the Low Light Mode This increases the sensitivity and brightens up the picture.</p>	 <p>A sequence of two small viewfinder images of a dark scene featuring a tall tower. An arrow points from the first, darker image to the second, which is significantly brighter, demonstrating the effect of the Low Light Mode.</p>

Notes for Use of the Sports Mode

- The subject must be brightly lit by sunlight or a Video DC Light (optional), with little shade.
- When filming under fluorescent, mercury-vapor or sodium lamps, the picture will be adversely influenced by flickering.
- When a scene filmed in the Sports Mode is played back in the normal playback mode, the picture movement may not be as smooth as normal.
- If the picture is recorded with high shutter speed, the playback picture will be slightly darker.

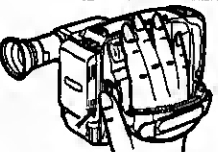

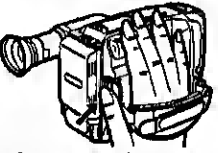

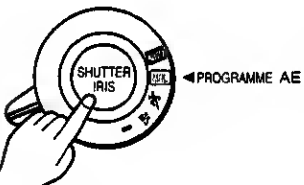
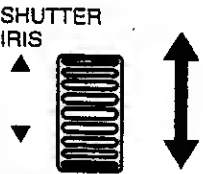
Procedure		Remarks, etc.
1 	To Return to the Normal Filming Mode 	<ul style="list-style-type: none"> • In the Sports Mode, the shutter speed is automatically adjusted (between 1/50 s and 1/500 s) according to the brightness of the scene, so even fast movements will be captured in sharp and stable pictures. • If the surrounding illumination is weak, the "⚡" indication flashes. In this case, the Sport Mode may not be effective.
1 	To Return to the Normal Filming Mode 	<ul style="list-style-type: none"> • Zooming in on the subject by pushing the [W • T] Zoom Lever toward "T" increases the blurring of the background.
1 	To Return to the Normal Filming Mode 	<ul style="list-style-type: none"> • Even if this mode is used for outdoor filming in daylight, the result will be almost the same as when filming in the other mode.

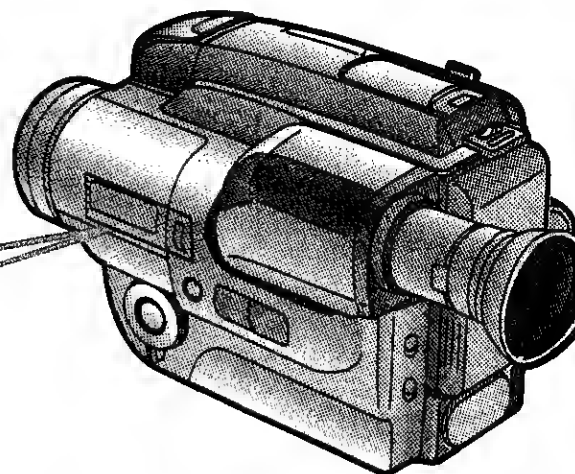
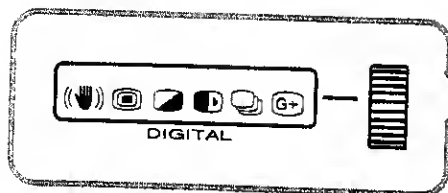


Title	Viewfinder	Procedure
<p>Fading In the Picture and Sound</p> <p>At the beginning of a movie, etc. fading in is often used. For example, after recording the title, starting the first scene with the Fade-in Function is very effective.</p>		<p>1</p>  <p>Keep pressed while in the Filming Pause Mode.</p>
<p>Fading Out the Picture and Sound</p> <p>Fading out is used to create a soft ending or (together with fade-in) for a soft transition from one scene to the next.</p>		 <p>Press during Filming at the point where you wish to fade out.</p>
<p>Adjusting the Shutter Speed and Iris</p> <p>In the Manual Mode, it is possible to adjust both the shutter speed and the iris.</p>		<p>1</p>  <p>Set the [AE] Dial to [MNL].</p>




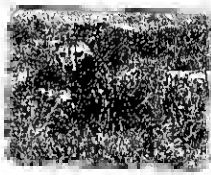



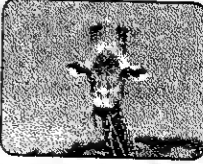


Notes for Adjusting the Shutter Speed and Iris

- When filming with the iris wide open, a blue sky may become whitish.
- In case of extremely strong backlight, it may not be possible to brighten up the subject sufficiently.
- Depending on the angle of the sunlight in filming, star-shaped light reflexes may be recorded in the picture.
- When filming with a high shutter speed, the playback picture will be slightly darker.

		Remarks, etc.
<p>2</p>  <p>Press after the picture in the Viewfinder has disappeared.</p>	<p>3</p>  <p>Release after approx. 3 seconds.</p>	
 <p>Press after the picture in the Viewfinder has disappeared.</p>	 <p>Release.</p>	
<p>2</p>  <p>Press.</p> <p>By pressing the button repeatedly, it is possible to change between the Shutter Speed Indication and the Iris Value Indication.</p>	<p>3</p> <p>SHUTTER IRIS</p>  <p>Turn.</p>	<p>In the Shutter Speed Indication Mode: Turning upward: The shutter speed becomes higher. Turning downward: The shutter speed becomes lower. Range of shutter speed adjustment: 1/50–1/4000 s The iris value is adjusted automatically.</p> <p>In the Iris value Indicaition Mode: Turning upward: The picture in the Viewfinder becomes brighter. Turning downward: The picture in the Viewfinder becomes darker. Range of iris adjustment: Closed→F16.0...F2.0→ Opened+0 dB...Opened+18 dB The shutter speed is fixed.</p> <p>To return to the Normal Filming mode Reset the [AE] Dial to "AUTO".</p>



- Simply by turning this Digital Dial, various digital effects can be obtained.
To cancel the Digital Function, turn the Digital Dial to the lowermost position so that none of the 6 indications is lit.





Title	Viewfinder
Digital Gain-up Function This function makes it possible to film dark scenes more brightly.	  
Digital Zoom Function The zoom magnification range is extended to 20x.	  
Digital Strobe Function This function makes it possible to continuously film still pictures of about 1/4 sec. duration.	
Digital Image Stabilizer Function This function compensates for possible shaking of the handheld Movie Camera.	  

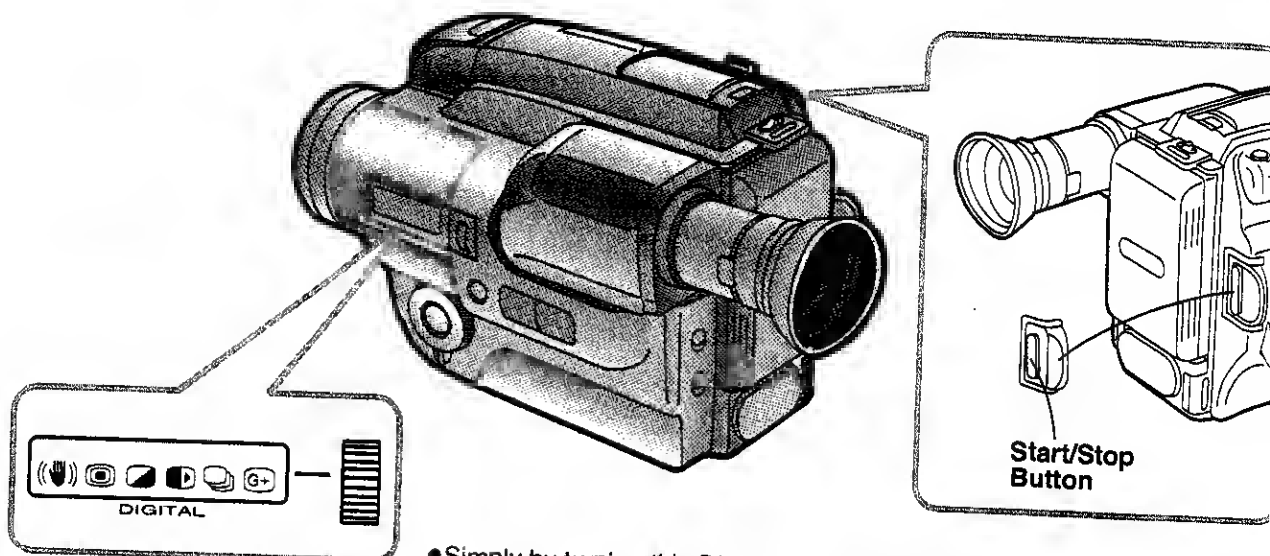
Conditions for Use of the Digital Image Stabilizer Function

- When using the Digital Image Stabilizer Function, the shutter speed is automatically adjusted between 1/50 s and 1/125 s.
- Cancelling the Digital Image Stabilizer Function also resets the shutter speed to 1/50 s. However, after selecting the Sports Mode or the Portrait Mode, cancelling the Digital Image Stabilizer Function does not reset the shutter speed to 1/50 s.

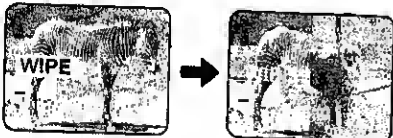

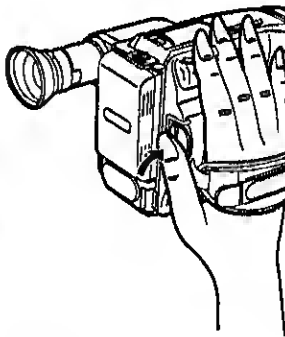
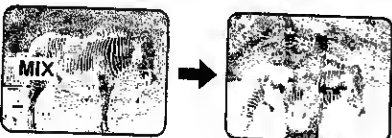

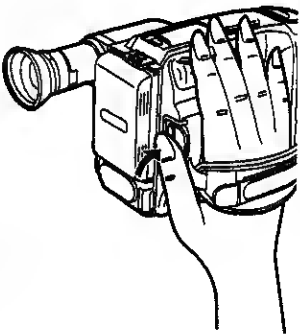
In the following filming conditions, the Picture Stabilizing Effect may not be sufficient:

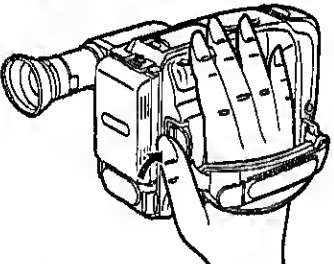
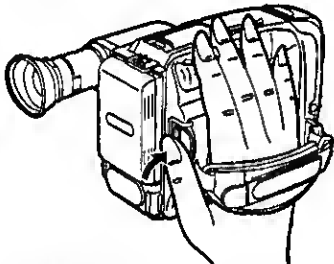
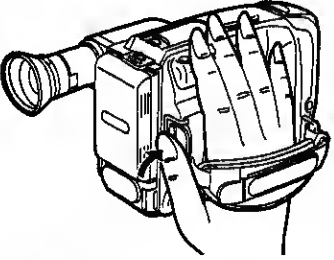
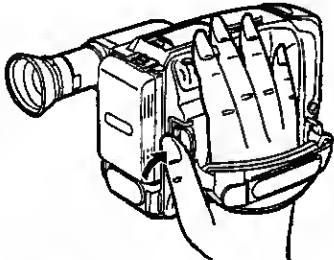
- A subject with horizontal or vertical stripes
- A flat subject
(The Digital Image Stabilizer Indication "DS" flashes in the Viewfinder.)
Increase the amount of light.
- A subject under many fluorescent lamps
- A fast-moving subject
- A subject with a flat background

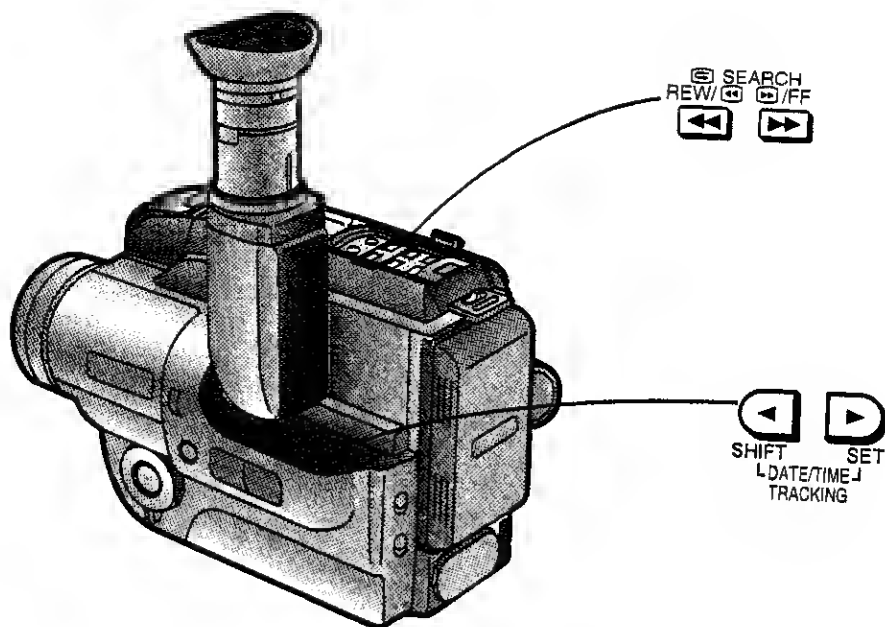
Procedure		Remarks, etc.
<p>1</p> 		<ul style="list-style-type: none"> • When using this function, some after-image distortion may occur. • The focus must be adjusted manually since the Movie Camera is automatically switched into the Manual Focus Mode. • The Sports Mode or the Portrait Mode will be cancelled automatically.
<p>1</p> 		<ul style="list-style-type: none"> • When the "D.ZOOM" Indication is displayed in the Viewfinder, the subject can be enlarged up to 20 times. • The zooming speed varies depending on how far the [W•T] Zoom Lever is pushed towards "W" or "T". (The further it is pushed towards either "W" or "T", the faster the zooming speed becomes.)
<p>1</p> 		<ul style="list-style-type: none"> • Since the strobe pictures are recorded from the digital image memory, the picture quality may be slightly inferior to that of normally recorded pictures. • When filming under fluorescent lamps, the brightness of the picture may fluctuate.
<p>1</p> 		<ul style="list-style-type: none"> • This function is especially practical for the following filming situations: <ol style="list-style-type: none"> 1. Zooming in on a distant subject. 2. Filming while walking. 3. Filming from inside a moving car. • The "D.ZOOM" Indication appears, too.



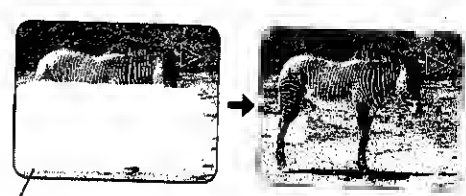


- Simply by turning this Digital Dial, various digital effects can be obtained.
- To cancel the Digital Function, turn the Digital Dial to the lowermost position so that none of the 6 indications is lit.

Title	Procedure	
<p>Fading Over from the Last Recorded Scene to the Next (Digital Wipe)</p> <p>This function makes it possible to achieve a smooth transition from the last recorded scene to the next scene. When starting to film the new scene, a still picture of the last scene appears, and it is then changed over to the last scene appears, and it is then changed over to the moving picture of the new scene with Digital Wipe (like opening a curtain).</p> 	<p>1</p>  <ul style="list-style-type: none"> • The "WIPE" Indication appears in the Viewfinder. 	<p>2</p>  <p>Press.</p> <ul style="list-style-type: none"> • The Filming starts.
<p>Fading Over from the Last Recorded Scene to the Next (Digital Mix)</p> <p>This function makes it possible to achieve a smooth transition from the last recorded scene to the next scene. When starting to film the new scene, a still picture of the last recorded scene appears, and it is then gradually replaced by the moving picture of the new scene.</p> 	<p>1</p>  <ul style="list-style-type: none"> • The "MIX" Indication appears in the Viewfinder. 	<p>2</p>  <p>Press.</p> <ul style="list-style-type: none"> • The Filming starts.

		Remarks, etc.
<p>3</p>  <p>Press.</p> <ul style="list-style-type: none"> • The Filming stops. The "WIPE" Indication becomes white. The last picture of the last recorded scene is kept in the memory. 	<p>4</p>  <p>Press.</p> <ul style="list-style-type: none"> • The picture (from the memory) appears as still picture. It is then gradually replaced from right to left by the moving picture of the new scene. 	<ul style="list-style-type: none"> • Since the still picture is recorded from the digital image memory, the picture quality becomes slightly inferior to that of normally recorded pictures. • Performing Recording Review or pressing [VTR/CAMERA] Button does not erase the picture in the digital image memory. • The still picture from the memory will be lost if the Movie Camera is turned off or if the Digital Mode is turned off or changed to a mode other than MIX or WIPE.
<p>3</p>  <p>Press.</p> <ul style="list-style-type: none"> • The Filming stops. The "MIX" Indication becomes white. The last picture of the last recorded scene is kept in the memory. 	<p>4</p>  <p>Press.</p> <ul style="list-style-type: none"> • The picture (from the memory) appears as still picture. It is then gradually faded over to the moving picture of the new scene. 	<ul style="list-style-type: none"> • Since the still picture is recorded from the digital image memory, the picture quality becomes slightly inferior to that of normally recorded pictures. • Performing Recording Review or pressing [VTR/CAMERA] Button does not erase the picture in the digital image memory. • The still picture from the memory will be lost if the Movie Camera is turned off or if the Digital Mode is turned off or changed to a mode other than MIX or WIPE.



Title	Procedure
<p>Checking the End of the Recorded Scene</p> <p>For occasionally important scenes, use this check function during filming to confirm that the recording has been performed correctly.</p>	<p>1</p>  <p>Press while in the Filming Pause Mode.</p>
<p>Locating a Point Where You Wish to Add a New Scene (Camera Search Function)</p> <p>Film the individual scene a little longer than actually required. You can then rewind the tape and determine the exact point where you wish to join the next scene. When the [SEARCH] Button is then released, the Movie Camera returns to the Filming Pause Mode.</p>	<p>1 ■ Reverse direction</p>  <p>Keep pressed while in the Filming Pause Mode.</p>
<p>Adjusting the Tracking</p> <p>When playing back a recorded tape, especially a tape recorded on another Movie Camera, horizontal bands of white noise may appear in the picture. If this occurs, the tracking needs to be adjusted.</p>	 <p>White noise</p>

2 To start the filming again



Press the Record Stat/Stop Button.

Remarks, etc.

- The final 2 seconds of the last recorded scene will be played back in the Viewfinder and then the Movie Camera returns to the Filming Pause Mode.

2 ■ Forward direction

SEARCH
REW/◀▶ FF



Keep pressed while in the Filming Pause Mode.

- When the [REW/◀▶] Button is kept pressed:
The Indication "◀◀" appears in the Viewfinder.
The scene is played back in reverse direction at 3 times normal speed.
- When the [▶/FF] Button is kept pressed:
The Indication "▶▶" appears in the Viewfinder.
The scene is played back in forward direction at normal speed.

1

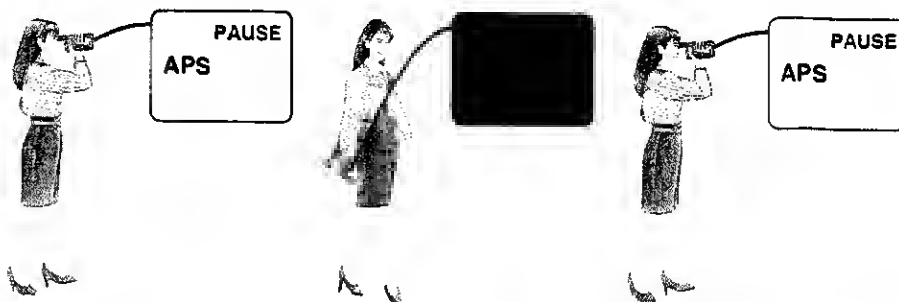
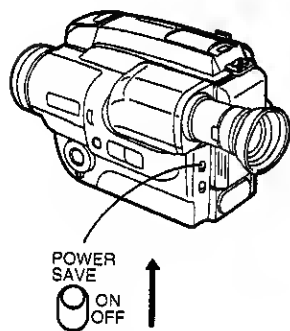


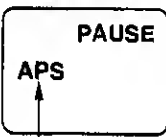
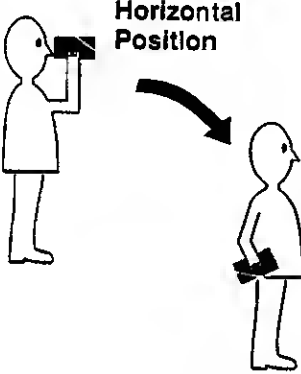


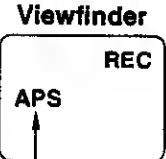

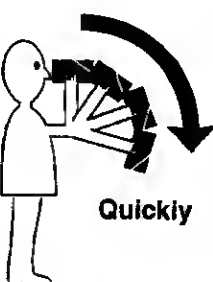


Press both the [◀ TRACKING] and [TRACKING ▶] Buttons simultaneously.

- If pressing both buttons simultaneously does not improve the picture quality, adjust by pressing the [◀ TRACKING] or [TRACKING ▶] Button individually. (It may not be possible to remove the noise bars completely.)

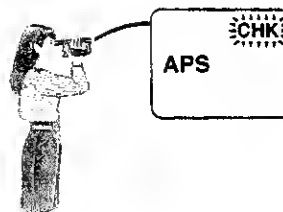
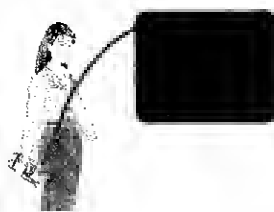
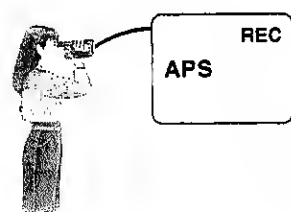
Using the Power Save Functions

① Auto Power Save (in the Filming Pause Mode)



	Movie Camera Mode	Becomes Activated:	Conditions of Movie Camera
① Auto Power Save Function	During Filming Pause  The "APS" Indication is displayed.	 <ul style="list-style-type: none"> • More than about 70° • More than a few seconds <p>• When Movie Camera is tilted downwards by more than about 70° from the normal horizontal filming position for more than a few seconds.</p>	 <ul style="list-style-type: none"> • Video and Audio will be faded during this mode so no picture or sound will be present. • Viewfinder: OFF • Auto Focus: OFF • Zoom Motor: OFF • VTR Indication: Flash (Green) 
② Anti-Ground-Filming Function	During Filming  The "APS" Indication is displayed.	<p>1)  Horizontal Position</p> <p>2)  Quickly</p> <ul style="list-style-type: none"> • More than about 70° • More than a few seconds <p>Activated</p> <p>• When tilting the Movie Camera downwards by more than about 70° from the normal horizontal filming position for more than a few seconds, and: 1) Walking with the Movie Camera held in the hand or; 2) tilting the Movie Camera quickly in the case of not walking.</p>	 <ul style="list-style-type: none"> • Video and Audio will be faded during this mode so no picture or sound will be present. • Viewfinder: OFF • Auto Focus: OFF • Zoom Motor: OFF • Filming Mode <p>Filming Pause Mode</p> <ul style="list-style-type: none"> • VTR Indication: Flash (Green) 

② Anti-Ground-Filming (In the Filming Mode)



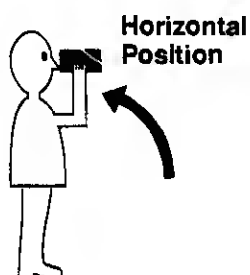
Result

To Resume Filming

Operating Restrictions

• **Saving Power**
The Battery Pack can be used longer for filming.

• **Preventing Lengthy Filming of the Ground**
The Movie Camera automatically prevents filming even when the Record Start/Stop Button is pressed accidentally.

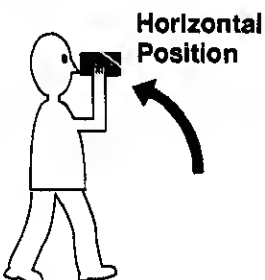


PAUSE

• When the Movie Camera is returned to an approximately horizontal position, the Movie Camera is automatically put into the Filming Pause Mode and the filming can be restarted by pressing the Record Start/Stop Button.

• **Saving Power**
The Battery Pack can be used longer for filming.

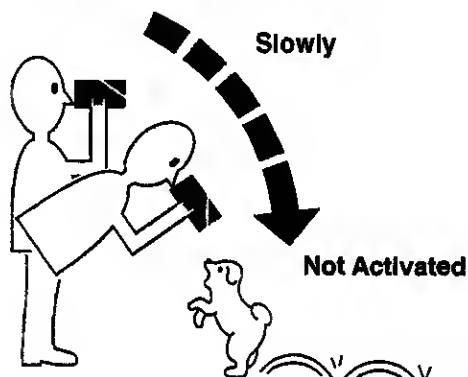
• **Preventing Lengthy Filming of the Ground**
The Movie Camera automatically switches over to the Filming Pause Mode to stop the unintentional filming when forgetting to press the Record Start/Stop Button at the end of a scene.



CHK

• When the Movie Camera is returned to an approximately horizontal position, the "CHK" (=check) indication will flash in the Viewfinder. Since the filming may have continued for several seconds, rewind the tape a little using the Camera Search Function (p. 42) to locate the exact end of the last desired scene, and then start filming again.

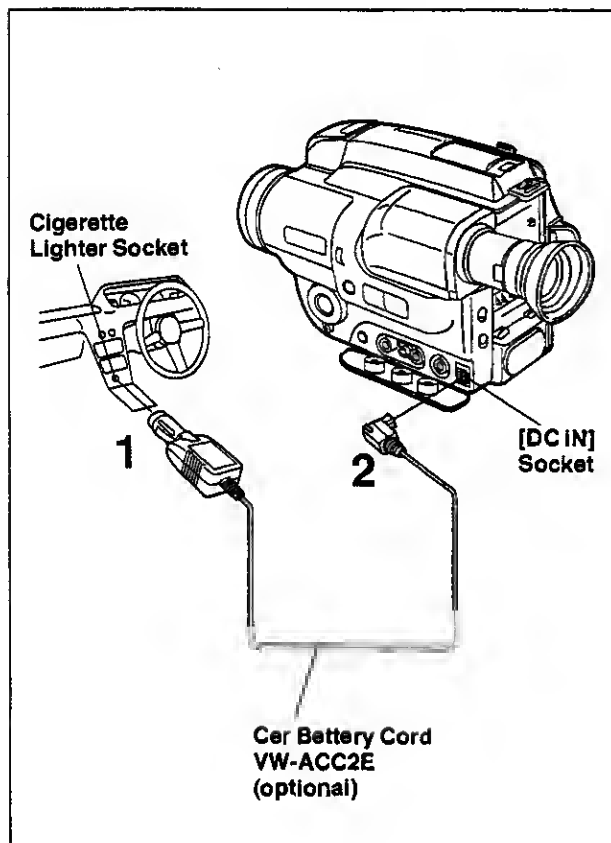
When slowly tilting the Movie Camera downwards during filming.



• This function is designed so that it is not activated when the Movie Camera is slowly tilted downwards during filming.
• The Anti-Ground-Filming feature is not intended to replace the manual stopping of filming.

Note: When changing locations between scenes or when not planning to film for a longer period of time, it is recommended to turn off the Movie Camera with the [POWER] ON/OFF Switch.

Using the Car Battery Cord (Optional)

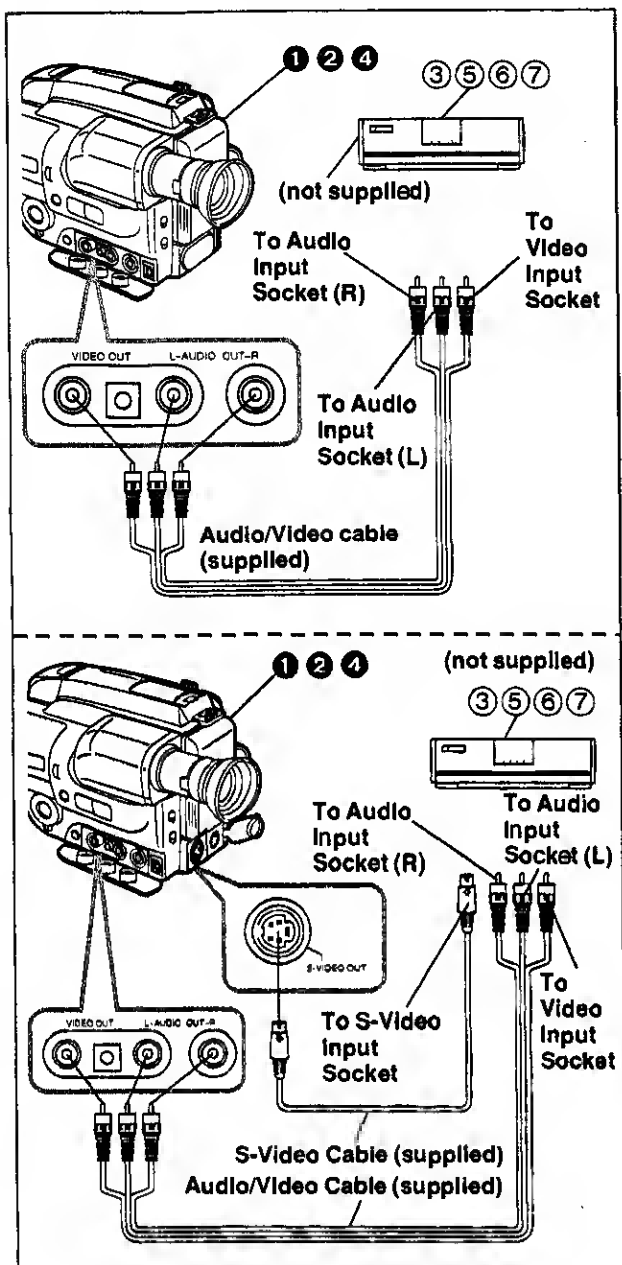


Notes:

1. The Car Battery Cord can only be used with 12 V DC negative-grounded vehicles.
2. Do not start the car engine while the Movie Camera is being powered by the car battery.
3. If the voltage drops suddenly e.g. because the car air-conditioner is turned on, the Movie Camera is automatically turned off to protect it. Wait about 10 seconds before turning it on again.
4. Some cars, RVs and campervans use 24 V. Please confirm with vendor that your vehicle uses 12 V before using the Car Battery Cord. If used on 24 V, damage may occur and is not covered by warranty.

- 1** Start the engine and then plug the Car Battery Cord into the Cigarette Lighter Socket.
- 2** Connect the other end of cord to the DC Input Socket on the Movie Camera.

Editing a Previously Recorded Tape



Connect the Movie Camera to the VTR using the Supplied Audio/Video Cable or S-Video Cable.

■ Operations

Playback Unit (Movie Camera):

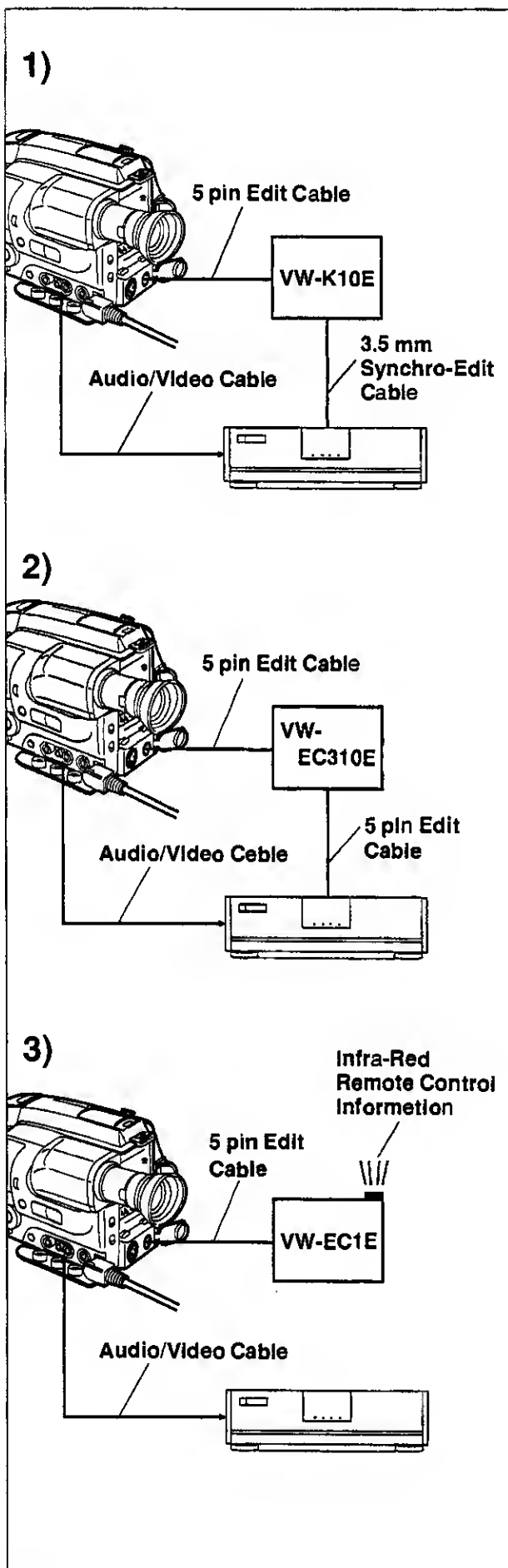
1 2 4

Recording Unit (VTR):

3 5 6 7

- ① Insert the recorded video cassette for playback into the Movie Camera.
Find the point on the tape where you want to cut and note the tape counter position.
- ② Rewind the tape and find the point where the dubbing is to start.
- ③ Insert the video cassette for recording into the VTR and put it in the Recording Pause Mode. Also read the Operating Instructions of the VTR.
The picture quality deteriorates slightly in the dubbing process, however, this can be minimized by selecting the standard recording speed (SP Mode) on the VTR.
- ④ Start the playback.
- ⑤ Press the Pause/Still Button to start recording.
- ⑥ Press the Pause/Still Button at the point where the dubbing is to end.
The VTR is now in the recording pause mode.
- ⑦ When the next scene which you want to record appears, press the Pause/Still Button one more time.

Editing a Previously Recorded Tape (cont.)



■ [NEW EDIT E] Socket

By connecting a Panasonic Editing Controller (optional) to this socket as well as to a Panasonic VTR equipped with Edit Socket, highly precise and speedy editing becomes possible.

The following types of Editing Controller can be used with this Movie Camera.

- 1) Connecting the Movie Camera to a Panasonic VTR equipped with synchro-edit socket (3.5 mm stereo jack) as the recording unit, using the 5 Pin Synchro Cord VW-K10E (optional).

- This is a single event edit controlling system.

Therefore, the user needs to know the start and end points of the scene to be edited and needs to start and stop the editing manually.

- 2) Connecting the Movie Camera to a of Panasonic VTR equipped with 5 pin edit socket as the recording unit, using the Editing Controller VW-EC310E (optional).

- This Editing Controller can be programmed for automatic editing of up to 8 scenes.

- When using this Editing Controller, be sure to edit with the "Standard-Speed Mode".

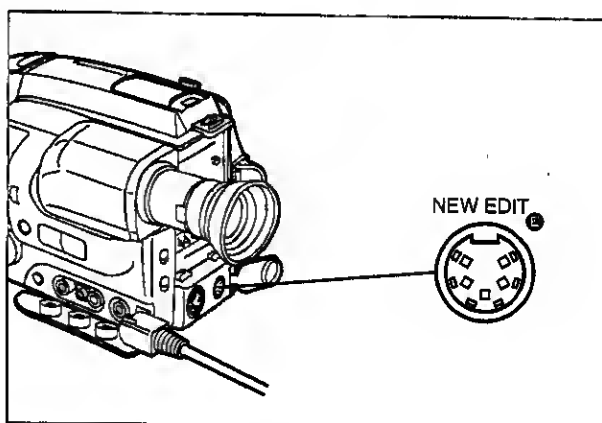
- 3) Connecting the Movie Camera to any brand of VTR equipped with Infra-Red Remote Controller as the recording unit, using the Editing Controller VW-EC1E (optional).

- This Editing Controller can be programmed for automatic editing of up to 4 scenes.

Note:

The full instructions as written in the Operating Instructions of the Editing Controllers and the 5 pin Synchro Cord must be followed or the edit function may not operate correctly.

This may not be a fault of the Movie Camera.



Using the VITC Function

■ VITC

As an address (individual number) is recorded for each frame, it is possible to find the accurate position of any desired scene or picture on a tape by checking the address during playback. This address is called "Time Code".

Since the VITC signals (Vertical Interval Time Code) are recorded together with the picture signals, (however, in a part that is not visible on the TV screen), they will not be cancelled even when the video cassette is taken out from the Movie Camera or the Movie Camera is switched off. This makes it possible to check the precise position of any desired picture at any time.

Notes:

1. The number indicated in the Viewfinder (Linear Counter or VITC Counter) is output through the [NEW EDIT E] Socket.
2. Do not switch between the "Linear Counter" and the "VITC" counter during editing with an Editing Controller.
3. Be sure to playback the last part of the recording to initialize the VITC signal and ensure that the information is recorded onto the tape after:
(A) Removing and reinserting the video cassette you have been filming on.
(B) Performing Rew or FF.
(C) Filming midway through a video cassette.
4. As the VITC Counter Indication displayed during FF or REW is only a rough approximation of the actual VITC value, it cannot be used for checking the precise VITC value (When performing FF or REW without having performed any playback, the VITC Counter Indication remains at zero.)
5. When editing with the Editing Controller VW-EC10 (optional), set the User Code to the "off" mode as explained in paragraph '3.6.2 Editing with "foreign" timecode' if of its Operation Manual.
6. To provide a blank leader portion (unrecorded tape) at the beginning of each video cassette, film for at least 20 seconds with the Lens Cap attached to the Lens.
7. Each time you start filming, small jumps may appear in the time code. Therefore, get into the habit of always starting the filming approx. 5 seconds before the action you wish to record actually starts.

■ Notes only for Performing VITC Editing with an Editing Controller

- During VITC editing with certain editing controllers, an error message may appear and prevent further editing. In this case, move the editing point forwards or backwards approx. 1 second and try to start editing again.

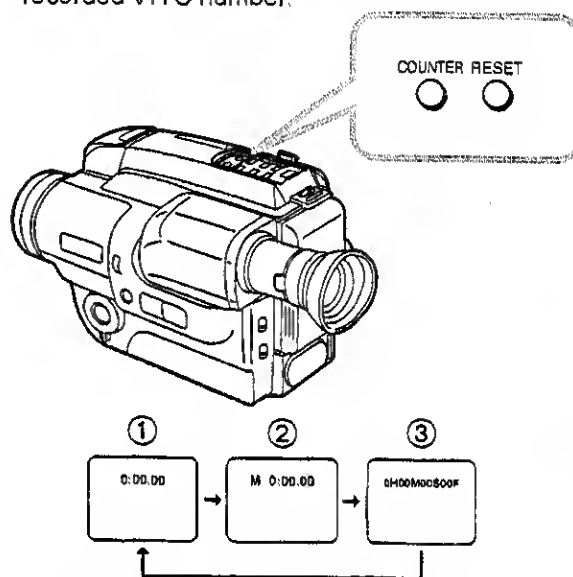
■ Type of user code

By selecting "DR-ON" or "DR-OFF" for the "VITC" in the MENU Mode, it is possible to select the two types of user code system. For calling up the MENU screen and selecting "DR-ON" or "DR-OFF" for the "VITC", see the page 32.

1 Recording of VITC Signals

During filming, VITC signals are also recorded automatically.

- When filming is started from an unrecorded part of a video tape, the VITC number begins from 0H00M00S00F (Hours, Minutes, Seconds, Frames). (1 Frame 1/25 s)
- When filming is started from the end of the previously recorded part of a video tape, the VITC number continues from the previously recorded VITC number.



To check the VITC number, press the [COUNTER] Button to make the VITC Counter Indication appear in the Viewfinder.

■ "VITC" → "DR-ON"

- The "DR" mark is displayed in the Viewfinder.



- The camera information and the date/time will also be recorded.

Note:

When using a VITC editing controller of another brand than Panasonic to edit a recording made with selecting "DR-ON" for the "VITC", accurate editing may not be possible. To ensure accurate editing with other brand VITC editing controllers, select "DR-OFF" for the "VITC" before filming.

■ "VITC" → "DR-OFF"

- The camera information and the date/time will not be recorded, therefore, it cannot be displayed during playback.

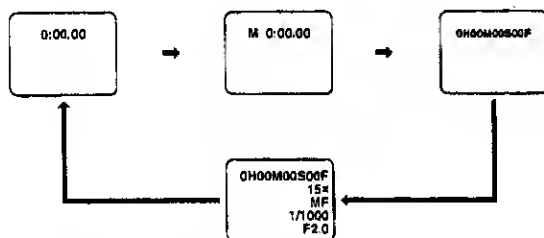
Using the Audio Dubbing Function

2 Playback of VITC Signals

●When a tape without recorded VITC signal is played back, or when the VITC signal drops out during the playback, the VITC Counter in the Viewfinder will show "--H--M--S--F".

■ Playing back a recording made with "VITC" set to "DR-ON"

Checking the VITC number and the camera information is possible by repeatedly pressing the [COUNTER] Button during playback in the VTR mode.

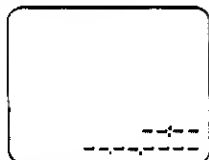


■ Camera Information

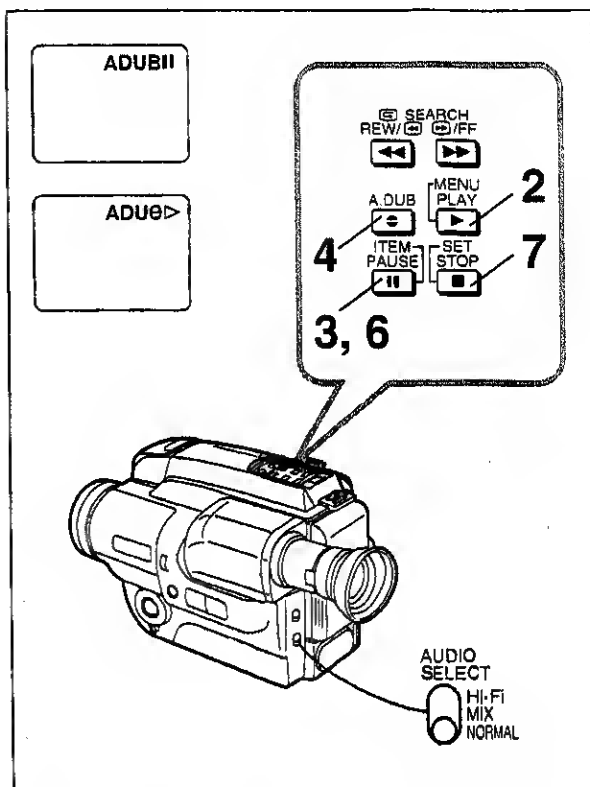
The camera information (zoom magnification, manual focus, shutter speed, iris setting, etc.) is automatically recorded together with the VITC signals. This information can be checked in the Viewfinder during playback. The date and time are also automatically recorded as part of the camera information. They can be checked in the Viewfinder during playback by pressing the [DATE/TIME] Button. (p. 10)

■ Playing back a recording made with "VITC" set to "DR-OFF"

●When Selecting "DR-OFF" for the "VITC", the date/time and camera information cannot be displayed during playback. Even if the [DATE/TIME] Button is pressed, only bars will be displayed as shown below.



●The camera information and the date/time cannot be displayed during playback.



Audio Dubbing can be performed by using the stereo microphone or an external microphone.




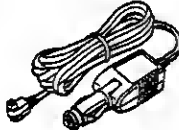


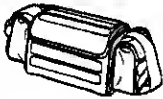
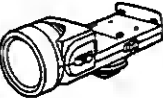
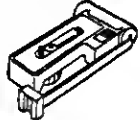







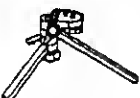



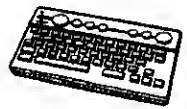
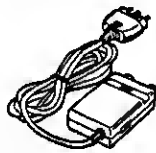

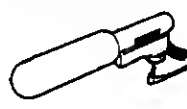

- 1 Insert the recorded cassette with the record prevention tab intact.
- 2 Press the [PLAY] Button in the VTR mode. Play back the tape to locate the point where you want to start the Audio Dubbing.
- 3 Press the [PAUSE] Button.
- 4 Press the [A.DUB] Button. The "ADUB II" Indication appears in the Viewfinder.
- 5 Operate the audio source unit.
- 6 Press the [PAUSE] Button again.
 - The Audio Dubbing starts.
 - The "ADUB ▷" Indication appears in the Viewfinder.
- 7 Press the [STOP] Button. The Audio Dubbing stops.

■ When playing back a cassette tape on which audio dubbing has been performed...

Use the Audio Selector Switch to select the sound to be played back.

- Hi-Fi: The original sound (sound before performing audio dubbing) alone can be heard.
- MIX: The original and the dubbed sound can be heard mixed together.
- NORMAL: The Dubbed sound alone can be heard.

Optional Accessories

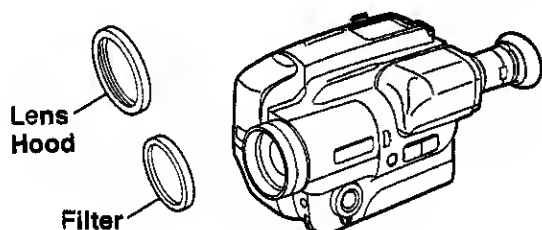
Battery Pack VW-VBS10E VW-VBH10E 	Battery Pack VW-VBS20E VW-VBH20E 	Car Battery Charger VW-KBC2E 	Car Battery Cord VW-ACC2E 	5 Pin Synchro Cord VW-K10E 
System Case VW-SHCS5E 	Soft Bag VW-SBS5E 	Video DC Light VZ-LDCS13E 	Shoe Adaptor VW-SK9E 	Filter Kit VW-LF37E 
Special Effect Filter Kit (A) VW-LFA37E 	Special Effect Filter Kit (B) VW-LFB37E 	Tele Conversion Lens VW-LT3714E 	Wide Conversion Lens VW-LW3707E 	Standard Tripod VZ-CT55E 
Deluxe Tripod VZ-CT75E 	Table Tripod VZ-CTT1E 	Cassette Adaptor VW-TCA7E 	Editing Controller VW-EC310E 	Editing Controller VW-EC1E 
Video Titler VW-VT1A 	RF Adaptor VW-RF7E 	Microphone RP-VMS65E (Stereo-type) 	Microphone RP-VM130E (Mono-type) 	Microphone RP-VM70E (Mono-type) 

Notes:

- Consult your dealer for details of other accessories not listed here.
- When using the Video DC Light and the microphone, the Shoe Adaptor (optional) is necessary.

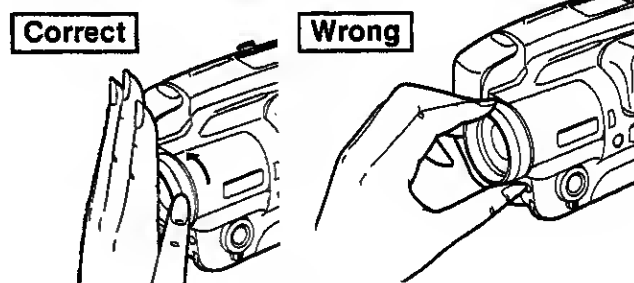
■ Lens Hood

Before attaching an optional filter or conversion lens, first remove the Lens Hood from the Movie Camera.

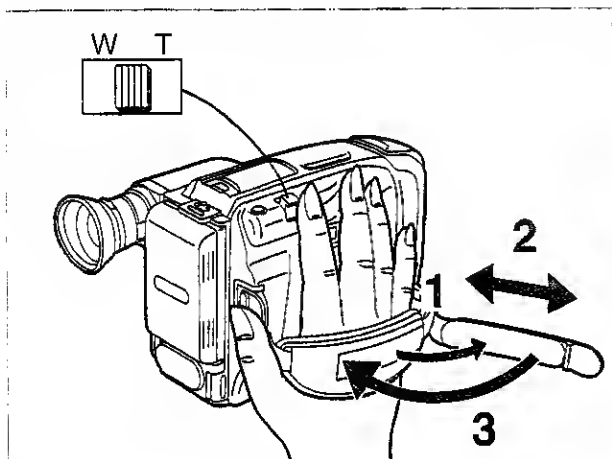


Battery Pack No.	Charging Time	Max. Filming Time
VW-VBS10E	Approx. 65 min.	Approx. 40 min.
VW-VBS20E	Approx. 130 min.	Approx. 80 min.
VW-VBH10E	Approx. 80 min.	Approx. 50 min.
VW-VBH20E	Approx. 160 min.	Approx. 100 min.

- To remove the Lens Hood, press with the palm of your hand against it and turn in the direction of the arrow.



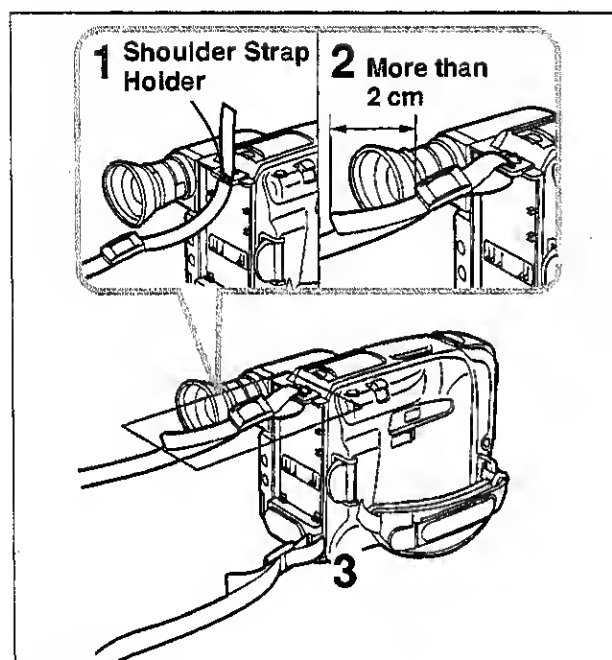
Adjusting the Length of the Grip Belt



Adjust the Grip Belt so that the Record Start/Stop Button can easily be pressed with the thumb and the [W • T] Zoom Lever can be pushed with the index finger.

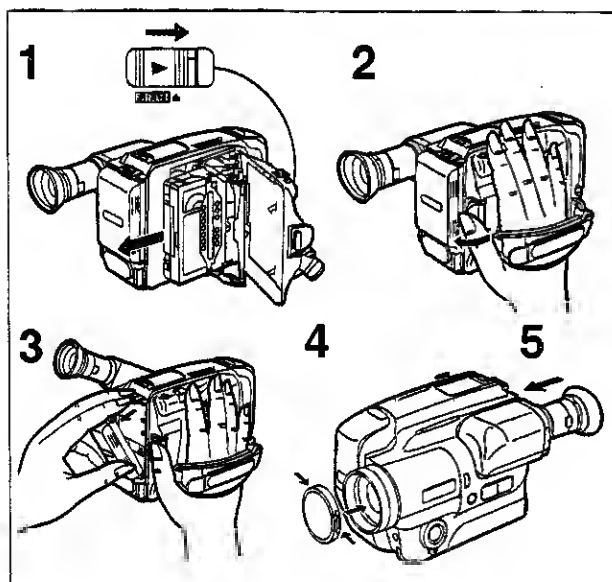
- 1** Unfasten the velcro tape closure.
- 2** Adjust the length to the size of your hand.
- 3** Fasten the velcro tape closure.

Attaching the Shoulder Strap



- 1** Pull the end of the Shoulder Strap through the Shoulder Strap Holder.
- 2** Securely attach the end of the Shoulder Strap. (More than 2 cm)
- 3** Attach the other end of the Strap in the same way.

Storage

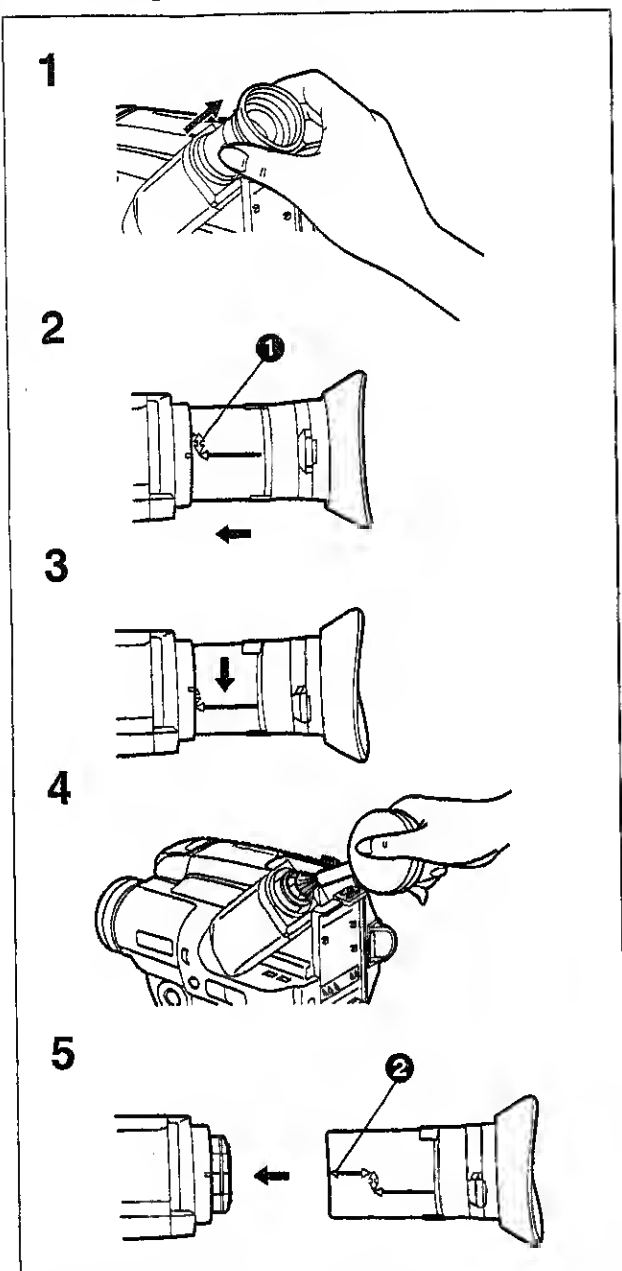


- 1** Slide the [EJECT] Lever and remove the video cassette.
- 2** Turn the [POWER] ON/OFF Switch in. (The Movie Camera is switched off.)
- 3** Slide the [BATTERY EJECT] Lever and remove the Battery Pack.
- 4** Attach the Lens Cap.
- 5** Retract the Viewfinder.

Note:

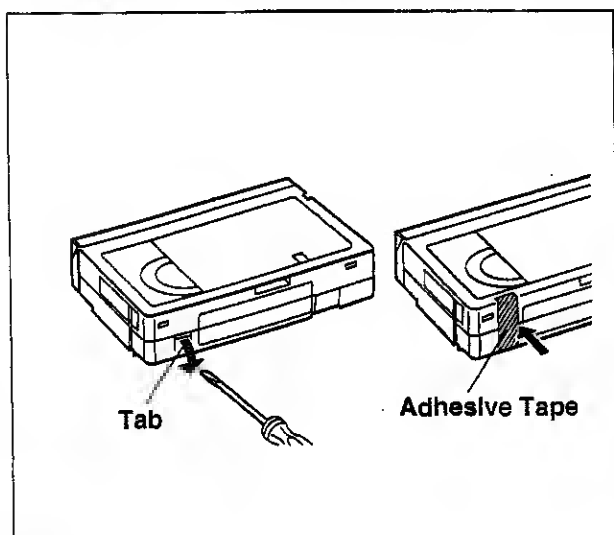
Remove the Battery Pack from the Movie Camera after use and keep it in a cool place. If the Battery Pack remains attached to the Movie Camera, a small amount of current flows to the Movie Camera even if the [POWER] ON/OFF Switch is turned in, and this shortens the battery life.

Cleaning the Viewfinder



- 1 Grasp the projections on either side of the Viewfinder and fully extend it.
- 2 Push the Viewfinder back in about 3 mm to the arrow ①.
- 3 Turn the Viewfinder counterclockwise until it stops, and then pull it off.
- 4 Remove dust with a blower brush.
- 5 To re-attach the Viewfinder, align it as shown in the illustration, slip it on as far as the arrow ② and then turn it clockwise.

Preventing Accidental Erasure of Recordings



When recording on a previously recorded tape, the previously recorded contents will be erased and replaced by the new recording. An important recording can be protected against accidental erasure by breaking off the tab. If the tab is removed, recording on this Video Cassette is no longer possible.




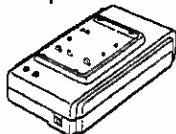
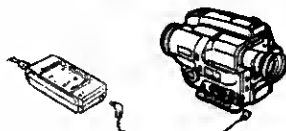
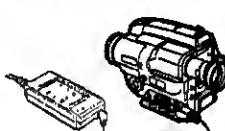

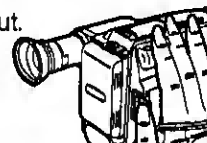




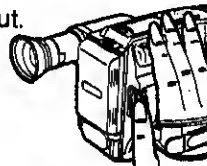

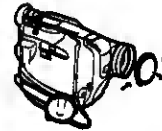
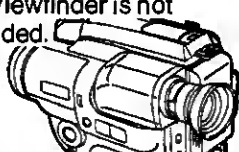
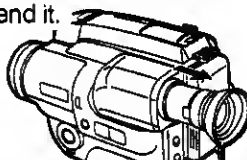
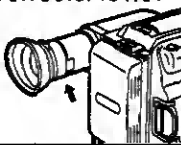
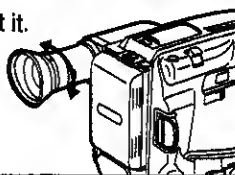
■ To protect important recordings against accidental erasure:











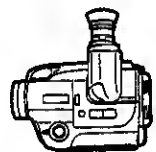





Break off the tab with a screwdriver in the direction of the arrow.

■ Recording onto a Video Cassette with a Missing safety tab:

Cover the hole firmly with two layers of Adhesive Tape.

Before Requesting Service

Item	Symptom	Cause	Action	Reference page	
Power	Using the Battery Pack 	•Movie Camera does not turn on.	•Not attached. 	•Attach it correctly. 	24
			•Not charged.	•Charge it.	24
		•Movie Camera turns off too soon.	•Exhausted.	•Use a fully charged one.	24
			•Filming was pause for more than 6 minutes.	•Turn the [POWER] ON/OFF in Switch inwards to turn off the Movie Camera, and then turn it outwards again to turn on the Movie Camera.	13
	Using the AC Adaptor 	•Movie Camera does not turn on.	•Not connected. 	•Connect correctly. 	6
	Using any of the power sources	•Movie Camera does not turn on.	•[POWER] ON/OFF Switch is not turned out. 	•Turn it out. 	8
•Movie Camera turn off too soon.		•Condensation has formed inside. 	•Wait several hours.	56	
Filming	 	•No picture in the Viewfinder.	•[POWER] ON/OFF Switch is not turned out. 	•Turn it out. 	8
			•Lens Cap is attached. 	•Remove it. 	8
			•The Power Save Function has been activated.	•Hold the Movie Camera in horizontal position.	44
		•Indications in the Viewfinder are not clear.	•The Viewfinder is not extended. 	•Extend it. 	8
		•Eyepiece Corrector is not adjusted. 	•Adjust it. 	8	
		•Lens is dirty.	•Clean it.	53	

Item	Symptom	Cause	Action	Reference page
Filming 	• Filming cannot be started.	• The erasure prevention tab of the inserted cassette is broken off. 	• Cover the tab hole with adhesive tape. 	53
		• No cassette is inserted. 	• Insert a cassette with intact erasure prevention tab.	8
		• Tape has reached its end. 	• Insert a new one.	8
	• Some noise from the zoom operation is picked up.	• The surroundings are very quiet.	• Use an external microphone (optional).	5
	• Date and time cannot be recorded.	• Date and time are not set. 	• Set the date and time. 	10
	• Date and time are not displayed in the Viewfinder.	• [DATE/TIME] Button was not pressed. 	• Press the [DATE/TIME] Button. 	12
		• Button-Type Battery is exhausted.	• Replace it with a new CR2032.	10
Playback (picture)  	• No picture. 	• [POWER] ON/OFF Switch is not turned outwards. 	• Turn the switch outwards and press the [VTR/CAMERA] Button so that the "VTR" Indication Lamp lights up.	20
		• Not connected or incorrectly connected to TV set.	• Connect correctly.	6
		• Wrong channel is selected on TV set.	• Select the correct channel.	—
	• Picture is not in colour or distorted. 	• Tracking is not adjusted.	• Adjust the tracking. 	42
	• Picture contains noise bars. 	• Cue, Review or Still Playback is activated.	• It is not a malfunction.	21

Cautions

In case of abnormal operation of this unit (e.g. if it emits smoke or some unusual smell), immediately stop the operation and consult qualified service personnel.

■ Cautions for Use of the Movie Camera

- When a thunderstorm approaches, stop using it. (If the AC Adaptor is being used, disconnect it from the mains outlet.)
- Do not aim the Lens at the sun. (This could damage internal parts of the Movie Camera.)
- Do not use it in the water or in places where water or some other liquid could splash on it. (If it is accidentally dropped into water while the AC Adaptor is being used, disconnect it from the mains outlet.)
- Do not use it with the cassette compartment facing down. (This could cause uneven winding of the tape.)
- Do not insert or remove the video cassette in dusty places.
- Do not use the Viewfinder as a carrying handle when transporting the Movie Camera.
- Do not disassemble or reconstruct it.
- Do not subject it to strong vibrations or shocks. Handle it with care to prevent accidentally dropping it.
- Do not insert any foreign objects into the Movie Camera nor spill water into it.
- Do not use it in areas with strong electric fields. (This could negatively influence the picture quality.)
- Do not operate it near a TV set or a radio. (This could distort the picture and sound reception.)
- Do not use it in places with steam or oily smoke.
- When unplugging the mains cable, pull it by the plug, not by the cable.

■ Cautions for Cleaning the Movie Camera

- Do not use benzine, thinner or other chemicals for cleaning, because they could change the colour and damage the surface of the camera body.
- When using a chemically treated cloth for cleaning, carefully follow the instructions for its use.
- Wipe the Movie Camera with a clean, dry cloth. Never use cleaning fluid or other chemicals.
- Clean the lens only with a blower brush (used for photo cameras) or special lens cleaning tissue (used for glasses and cameras).

■ Cautions for Storage

- Do not store this Movie Camera in the following places.
Places exposed to direct sunlight.
Places with high temperature and high humidity (e.g. in a closed car or in a bathroom).
Near heaters.
- Do not leave it in direct contact with rubber or plastic products for a long time.
- Keep it out of reach of children.

■ Cautions for Transport

- When not actually filming, carry it in a specially designed Carrying Case.
- Keep the packing materials. When transporting it in the future, pack it in the same way as you purchased it.

■ Cautions for the Video Head Clogging

When the "U 11/3" flashes, consult qualified service personnel.

It is not recommended to use head cleaning tapes in this Movie Camera, because they may cause damage or the tape may become stuck. The removal of head cleaning tape is not covered by warranty.

Condensation

If Condensation Has Formed Inside the Movie Camera, Filming is Not Possible.

■ Symptoms of Condensation

- If the following symptoms occur, condensation has formed inside the Movie Camera.
 - ① The Condensation Indication in the Viewfinder flashes.
(After this indication flashes for a few seconds, the Movie Camera will automatically turn itself off again.)
 - ② When turning on the Movie Camera, it turns itself off.
(However, the Movie Camera also turns itself off when the Battery Pack is exhausted.)

■ Remedy

- Wait a few hours before operating the Movie Camera again.
(The actual time depends on the surrounding conditions.)
- Turn on the Movie Camera.
- Confirm that the Condensation Indication is not displayed any more.
- For added safety, wait about 1 more hour.

■ Remarks about Condensation

- Condensation can form if the Movie Camera is suddenly brought from cold surroundings to a place where it is hot or humid.
- Since condensation forms gradually, there may already be some condensation inside the Movie Camera even before the Condensation Indication begins to flash.
- In an extremely cold place, condensation may freeze and turn into frost. As the Movie Camera cannot detect frost, the Condensation Indication does not appear until the frost melts.

■ Precautions against Condensation

When moving it from a very cold place to a very warm place, keep it in a tightly closed plastic bag or similar to prevent condensation from forming.

Questions & Answers

1 Power Sources

Q: What types of power sources can be used for this Movie Camera? And how are they used?

A: There are basically the following 3 different power sources.

- 1) Battery Pack: Use it when filming outdoors and indoors, when there is no mains socket available.
- 2) AC Adaptor: Use it to connect the Movie Camera to a mains socket when filming indoors or near a mains socket outdoors.
It can also be used to save Battery Pack power when setting the time and date of the built-in clock, or when trying out some camera functions.
- 3) Car Battery Cord: Use the Car Battery Cord (optional) to connect the Movie Camera to the cigarette lighter socket.

Q: Why isn't the Battery Pack sold in charged condition?

A: Ni-Cd (Nickel-Cadmium) Battery Packs or Ni-MH (Nickel-Hydrogen) Battery Packs can be used with this Movie Camera. Both types are subject to self-discharging, i.e. their capacity will decrease gradually when they are left unused after charging. In one month, the capacity decreases by approx. 20%. Therefore, to ensure that you have the maximum charge available for filming, be sure to charge the Battery Packs no more than a few days before using them.

Q: In spite of fully charging a Battery Pack, its operation time is much shorter than expected...?

A: This may be due to one of the following reasons:

- 1) The maximum operation time of the Battery Pack listed in the Operating Instructions is for continuous filming at an ambient temperature of 20°C. However, the use of the zoom and other functions increases the power consumption, so that the actual recording time per Battery Pack is 30%–50% less than for continuous filming.
- 2) The Battery Pack is used at the place with low temperature e.g. a ski slope.
The useful operation time of the Battery Pack becomes shorter as the ambient temperature gets lower. When filming on a ski slope, for example, it may be possible to film no longer than 5 minutes, even when using a fully charged Battery Pack. Therefore, it is recommended to take along 3–5 times as many charged Battery Packs as you would for filming at normal temperature. Also, using large-capacity Battery Packs will give you double the uninterrupted filming time of normal ones.

Q: Are there any ways to refresh the Battery Pack whose useful operation time has become very short?

A: Refreshing Battery Packs is possible with the following procedures:

Continue charging the Battery Pack for an additional 24 hours after the Charging Indication Lamp goes out. However, if the useful operation time is still too short for normal use, even after this procedure, the service life of the Battery Pack has reached its end.

Q: How often can a Battery Pack be recharged?

A: Approx. 200 times.

Q: How can one distinguish charged from discharged Battery Packs?

A: There is no difference in appearance. Therefore, it is recommended to make use of the marker on the Battery Pack.

For example, slide the marker so that the red dot is visible for a charged Battery Packs and slide it the other way so that the red dot is not visible for partially or completely discharged Battery Packs.

Questions & Answers (cont.)

Q: Are there any points to observe for effective use of the Battery Pack?

A: Observe the following points faithfully.

- 1) Charge the Battery Pack immediately before use or on the day before.
- 2) When the filming of a scene is finished, turn off the Movie Camera.
- 3) Since the operation time of the Battery Pack becomes shorter at low ambient temperature, wrap the Movie Camera with a towel or blanket so that it does not get cold when carrying it outside.
- 4) When the Battery Pack is not being used, remove it from the Movie Camera and store it in a cool place. If the Battery Pack is left attached to the Movie Camera for a long period of time, excessive discharging may occur, and it will not be possible to use such a Battery Pack again.
- 5) When carrying or storing the Battery Pack, ensure that no metal objects e.g. keys, etc. touch the connectors of the Battery Pack.

Q: After turning on the Movie Camera, the "CAMERA" indication Lamp flashes and the Movie Camera turns itself off immediately.

A: This may be due to one of the following reasons:

- 1) The Battery Pack is completely discharged.
- 2) Condensation has formed inside the Movie Camera.

Q: About 6 minutes after turning on the Movie Camera, it turns itself off again...

A: If the Movie Camera is left in the Filming Pause Mode (PAUSE) for more than 6 minutes, it will automatically turn itself off to protect the video tape.

Turn it on again to start filming.

(The Movie Camera turns itself off, even if no video cassette is inserted.)

Q: Can the AC Adaptor be used in any country?

A: Yes. It can be used all over the world.

The AC Adaptor adjusts automatically to local voltage (100 V, 120 V, 220 V or 240 V). (However, since the shape of the mains socket differs almost from country to country, mains adaptor plugs are necessary. Before travelling abroad, confirm what type of mains socket is used in the country of your destination and take along the matching adaptor plug.)

2 Video Cassettes

Q: What kind of video cassettes can be used in this Movie Camera?

A: All video cassettes carrying the "VHS [C]" or "S-VHS [C]" logo mark can be used.
[C] stands for "Compact".

Q: What is the difference between "VHS" and "S-VHS" video cassettes? Are they compatible?

A: "VHS" stands for Video Home System. "S-VHS" stands for Super Video Home System. The S-VHS system was developed based on the VHS system to provide enhanced picture resolution and higher overall picture quality. For this reason, it is named "Super".

When recording (filming) in the S-VHS system, these recordings can only be played back on equipment carrying the "S-VHS" or "SQPB" logo mark.

Cassette	Equipment for recording		Recording System	Equipment for Playback		Playback System
VHS	VHS	Movie Camera VTR	VHS	VHS	Movie Camera VTR	VHS
	S-VHS			S-VHS		
	VHS	Movie Camera VTR	VHS	VHS	Movie Camera VTR	VHS
S-VHS	S-VHS		S-VHS	S-VHS SQPB		S-VHS

Q: Is it possible to record on the both sides of a video tape?

A: No. Video cassettes can only be recorded on one side.
Therefore, there is only one way in which video cassettes can be inserted into the Movie Camera or a VTR.
Insert it in the direction indicated by the arrow on the video cassette.

Q: How often can a video cassette be used?

A: In normal use approx. 100 times.

Q: Does removing the video cassette in bright daylight erase part of the recording?

A: No. Video cassettes contain magnetic tape, and light does not negatively influence it.

Q: Does the security scanning equipment at airports damage video cassettes?

A: No.

Q: Is there any way to protect important recordings against accidental erasure by recording again on a previously recorded tape?

A: If the tab of a video cassette is broken out, it cannot be recorded any more.
However, when you want to record again on that video cassette, firmly cover the hole where the tab was with two layers of adhesive tape.

Q: What precautions must be observed for handling video cassettes?

A: Special attention should be paid to the following points:

- 1) Before inserting a video cassette into the Movie Camera, make sure that the tape is tight. If it is loose, turn the cog wheel to tighten it.
- 2) After filming, remove the video cassette from the Movie Camera, put it back into its case and store it in vertical position. Stacking the video cassettes could deform them and damage the edges of the tape.
- 3) Since the video cassettes are easily affected by dust, high humidity and high temperature, store them in a cool place that is not exposed to direct sunlight.
- 4) Do not place them near electronic equipment with a strong magnetic field.
- 5) Be sure to fully rewind the tape to its beginning before storing the video cassette.
- 6) Expose the tape to air by fast-forwarding and then rewinding it once a year.

Q: I filmed in the S-VHS system, but my home VTR uses only the VHS system. How can I play back?

A:

- 1) Connect the S-VHS Movie Camera with an AV Cable directly to the TV set and play back on the Movie Camera.
- 2) Or connect the S-VHS Movie Camera with an AV Cable to the VHS VTR and (by using the S-VHS Movie Camera as playback unit and the VHS VTR as recording unit) copy the video movie over into the VHS system.

Questions & Answers (cont.)

3 Filming

Q: Is it possible to film at night or in a dimly lit room?

A: At the light of at least one candle, filming is still possible.

In the specifications, the minimum required illumination is listed as 1 lux. As a rough estimate, at a distance of 30 cm, the light cast by a burning candle is 7 lux. Since the minimum required illumination is lower than this, filming is possible.

(To brighten up a dark scene, use the Digital Gain-up Mode.)

Q: What precautions must be observed for filming performances on a stage?

A: A subject that is brightly lit by spot-lights surrounded by dark parts of the stage or hall may result in excessive contrast and cause the subject to appear whitish in the playback picture. To prevent this, zoom in on the subject so that the brightly lit area fills most of the picture.

Q: Faces in the playback picture appear dark...?

A: This may be due to the following reasons:

1) When filming backlit scenes:

It is a basic rule to film your subjects with the sun in your back, just like for taking photos. Also zoom in on the subject so that strong light sources are no longer close to the subject in the picture, and then start filming. Be careful when filming outside from inside a room, because the same phenomenon could occur. In some situations, using the Video DC Light (optional) may help to brighten up the subject.

2) The surroundings are too bright. When filming on a beach in summer or on a ski slope, the light may be too strong because of the added light reflection from the water, sand or snow, causing the subject to appear dark in the playback picture. Zoom in on the subject so that strong light sources are no longer close to the subject in the picture, and then start filming.

Q: What precautions must be observed for filming on a beach?

A: Pay attention to the following 4 points:

1) Splashing Sea Water

Water, especially saltwater, splashing on the Movie Camera may cause mold. Take care that no water splashes onto the camera. If saltwater has splashed on it, or if it was exposed to a sea breeze (containing salt), wipe it with a clean, damp cloth after filming.

2) Sand (Dust)

Take great care that fine sand does not enter the Movie Camera, as it can cause serious malfunction. Also, do not insert or remove the video cassette in places with much dust.

3) Heat (High temperature)

Almost the entire body of the Movie Camera is black. If it is exposed to direct sunlight for a long time, the temperature inside it will rise excessively and cause malfunction.

4) Light (Too Bright)

The reflection of light on a beach in summer is much stronger than may be realized. Just like you can see much more comfortably under such conditions if you wear sunglasses, the pictures filmed with the ND Filter attached to the lens will be much more comfortable to watch.

"ND" stands for Neutral Density, and this filter reduces strong light in a similar way as sunglasses, but without tinting the picture brown.

Q: While filming with the Movie Camera, is it possible to monitor the picture on a TV set?

A: Yes. Simply use an Audio/Video Cable to connect the Video Output Socket of the Movie Camera with Video Input Socket of a VTR or of a TV set and select the video playback channel on the TV set.

Q: Is it possible to film without sound?

A: If the Movie Camera is equipped with a socket for connecting an external microphone, insert an M3 type plug (that is not connected to anything) into the socket. This deactivates the built-in microphone.

Q: What precautions must be observed for filming in a cold place, for example on a ski slope?

A: Pay attention to the following points.

1) Protection against Water (Snow)

Take care that the Movie Camera does not get wet with snow.

Even if only very little snow is left on the Movie Camera, it may melt and flow inside. Therefore, prepare a plastic bag, some other waterproof bag or a towel or small blanket. After filming, wrap the Movie Camera with a towel or blanket etc. and put it into the plastic bag.

2) Protection against Cold (Low temperature)

The temperature range for normal operation of the Movie Camera is 0°C–40°C. The colder the ambient temperature becomes, the shorter becomes the operation time of the Battery Pack. Be sure to take along extra Battery Packs. After use, wrap the Movie Camera with a towel or blanket, etc. to keep it warm.

3) Strong Light (Too bright)

On a ski slope, the direct sunlight and the light reflected by the snow surface is surprisingly strong.

As the iris automatically adjusts to the white snow, the people and their colourful ski wear will appear too dark in the playback picture.

To prevent this, zoom in on the subject so it occupies as much as possible of the picture, or use an ND Filter (optional).

4) Condensation (When the Movie Camera is brought from cold surroundings into a warm room)

When you bring the Movie Camera from a ski slope, etc. into a warm room, condensation will form inside the Movie Camera and the video cassette. This is the biggest danger to the proper functioning of the Movie Camera. If the Condensation Indication appears in the Viewfinder, filming is no longer possible. Immediately take out the video cassette and turn the Movie Camera off. Wait for the Movie Camera to warm up and turn it on about once an hour to check if the Condensation Indication is still visible. It may take several hours before this Indication disappears and filming can be resumed.

To prevent condensation from forming, wrap the Movie Camera with a towel or small blanket to prevent it from getting cold during filming.

Before taking the Movie Camera into a warm room, put it into a plastic bag and close it tightly. Do not take it out of the bag for at least one hour, so that it can slowly acclimate to the room temperature.

4 Playback

Q: Is it possible to play back video cassettes filmed in a foreign country via a TV set in that country?

A: Basically, there are 3 television systems used in the world. If the TV set uses the same television system as the Movie Camera, it can be used for playback.

1) PAL (Great Britain, Germany, Australia, Holland, Italy, Spain, China, etc.)

2) SECAM (France, Greece, Iran, Russia, etc.)

3) NTSC (USA, Canada, Japan, Korea, Philippines, etc.)

Q: When playing back on a VTR a video cassette recorded with the Movie Camera, some noise bars appear in the picture. How can I eliminate them?

A: The tracking of the two units is not precisely matched.

Eliminate the noise bars by adjusting with the tracking control on the VTR.

When filming and playback are performed on the same unit, the tracking will match precisely.

Q: The Movie Camera is connected to the TV. However, no playback picture appears on the TV screen...?

A: Select the video playback channel on the TV set.

Q: The red lever on the side of the Cassette Adaptor stands out and prevents inserting the Cassette Adaptor into the VTR...?

A: Insert a battery (R6) into the Cassette Adaptor. If the battery is exhausted, replace it with a new one.

Index

A

AC Adaptor (p. 6, 24)
AC Mains Cable (p. 6, 24)
[AE] Dial (p. 13, 26, 28, 35, 36)
Anti-Ground-Filming Function (p. 44)
[AUDIO OUT] Socket (p. 6)
Auto Focus Mode (p. 26)
Auto Mode (p. 13)
Auto Power Save Function (p. 44)
Automatic White Balance Mode (p. 28)
[AUDIO SELECT] Switch (p. 50)
[A.DUB] Button (p. 50)

B

Button-Type Battery Compartment (p. 10)
[BATTERY EJECT] Lever (p. 25)
Battery Pack (p. 24)
Before Requesting Service (p. 54)

C

"CAMERA" Indication Lamp (p. 8)
Camera Search Function (p. 42)
Car Battery Cord (p. 46)
Cassette Adaptor (p. 22)
[CHARGE] Lamp (p. 24)
"CHK" Indication (p. 42, 45)
Condensation (p. 56)
Cue Playback (p. 20)
Camera Information (p. 50)

D

[DATE/TIME] Button (p. 10)
Date/Time Setting (p. 10)
DC Input Socket (p. 6)
Digital Dial (p. 38, 40)
Digital Image Stabilizer Mode (p. 38)
Digital Zoom Mode (p. 38)
Digital Zoom magnification (p. 38)
Digital Gain-up Mode (p. 38)
Digital Strobe Mode (p. 38)
Digital Mix Mode (p. 40)
Digital Wipe Mode (p. 40)

E

[EJECT] Lever (p. 8)
Error Code (p. 17)
Eyecup (p. 53)
Eyepiece Corrector Ring (p. 9)

F

[FADE] Button (p. 36)
FF (Fast-Forward) (p. 20)
[FOCUS] Button (p. 26)
Focus Ring (p. 27)

G

Grip Belt (p. 52)

H

Head Clogging (p. 55)

I

Index signal (p. 12, 19)
Infra-Red Sensor (p. 28)
[ITEM/PAUSE] Button (p. 21, 33)

L

Lens Cap (p. 8, 28)
Low Light Mode (p. 34)

M

Manual Focus Mode (p. 26)
Manual White Balance Mode (p. 28)
Max. Filming Time with Battery Pack (p. 25)
[COUNTER] Button (p. 14)
[MIC] Socket (p. 5)
[MENU/PLAY] Button (p. 21, 33)
Menu Indication (p. 32)

N

[NEW EDIT E] Socket (p. 48)

O

Optional Accessories (p. 51)

Portrait Mode (p. 34)
[POWER] ON/OFF Switch (p. 8)
[POWER SAVE] Switch (p. 44)
[PHONES] Socket (p. 20)

Zoom (p. 12)
Zoom magnification (p. 12)

Rec Check (p. 42)
Record Start/Stop Button (p. 12)
Remaining Tape Time (p. 14)
[RESET] Button (p. 14)
REW (Rewind) (p. 20)
Review (p. 20)
[RF DC OUT] Socket (p. 4)

Shoulder Strap Holders (p. 52)
Sports Mode (p. 34)
Standard Accessories (p. 3)
Still Playback (p. 21)
[S-VIDEO OUT] Socket (p. 7)
[SHUTTER/IRIS] Control (p. 37)
[SHUTTER/IRIS] Button (p. 37)
[SNAPSHOT REC] Button (p. 33)
[SET/STOP] Button (p. 21, 33)

Tape Counter (p. 14)
Tape Length (p. 15)
Tripod Receptacle (p. 5)
Tracking Adjustment (p. 42)

Viewfinder (p. 16)
[VIDEO OUT] Socket (p. 6)
VISS (p. 19)
"VTR" Indication Lamp (p. 20)
VITC (p. 49)

Warning/Alarm Indication (p. 16)
[W.B] Button (p. 29)
[W•T] Zoom Lever (p. 13)

Specifications

S-VHS-C Movie Camera

Information for your safety

Power Source: 4.8 V (Battery Pack)
6.0 V (AC Adaptor)

Power Consumption: 8.3 W (Battery Pack Operation)

• The rating plate is on the bottom side of the Movie Camera.

Video Recording System:

Rotary four heads, helical scanning system

Tape Speed: 23.39 mm/s

Tape Format: S-VHS-C/VHS-C tape

Recording/Playback Time: 45 min. with NV-SEC45XD

VIDEO

Television System: CCIR; 625 lines, 50 fields
PAL colour signal

Modulation System: Luminance; FM azimuth recording
Colour signal; Converted subcarrier phase shift recording

Output Level: VIDEO OUT (PHONO);
1.0 Vp-p, 75 ohm unbalanced
S-Video Out; 1.0 Vp-p, 75 ohm unbalanced

AUDIO

Output Level: AUDIO OUT (PHONO);
-6 dB, 47 kohm loaded
Phones (M3); -22.5 dB
32 ohm loaded

Input Level: MIC IN (M3); -70 dB,
4.7 kohm or more unbalanced

Audio Track: 1 track (Normal-Monaural)
2 channels

Image Sensor: 1/8-inch CCD Image Sensor
Lens: 10:1 Variable Speed Power Zoom Lens with Digital AI Auto Focus
Focal Length; 4.6-46 mm
F1.8
Auto Iris
Filter Diameter; 37 mm

Viewfinder:

0.5-inch Electronic Viewfinder

Standard Illumination:

1,400 lux

Minimum Required Illumination:

1 Lux (Digital Gain-up Mode)

Video Horizontal Resolution:

S-VHS; 400 lines
(S-VIDEO OUT)
VHS; 250 lines

Signal-to-Noise Ratio:

Video; More than 43 dB
Audio; More than 47 dB
(Hi-Fi)
More than 41 dB
(Normal)

Audio Frequency Response:

Hi-Fi; 50-20,000 Hz
Normal; 80-8,000 Hz

Operating Temperature:

0°C-40°C

Operating Humidity:

10%-80%

Weight:

Approx. 820 g
(without Battery Pack)

Dimensions:

Approx. 111 (W) x 116 (H) x 215 (D) mm

AC Adaptor

Information for your safety

Power Source: AC 100-240 V,
50-60 Hz
(Automatic voltage adjustment)

Power Consumption:

25 W

DC Output: DC 6.0 V, 8.5 W
(Movie Camera Operation)
DC 4.8 V, 1.2 A
(Battery Pack Charging)

• The rating plate is on the bottom side of the AC Adaptor.

Weight:

Approx. 210 g
(without AC Cable)

Dimensions:

Approx. 72 (W) x 39 (H) x 143 (D) mm

Weight and dimensions shown are approximate. Specifications are subject to change without notice.



Printed in Japan
VQT5743

S0694S1094-200 ©

Matsushita Electric Industrial Co., Ltd.

Central P.O. Box 288, Osaka 530-91, Japan